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JOURNAL OF EDUCATIONAL RESEARCH

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JOURNAL *of* EDUCATIONAL RESEARCH

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THE RELATION OF PHILOSOPHY TO SCIENTIFIC RESEARCH[1]

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THE problem here discussed may perhaps best be understood from the letter arranging the meeting, the gist of which appears in the following excerpts:

"There are scientific workers who have no place in their thinking for formal philosophy, and who, in discussion, feel that philosophy has no value for them . . . .

"On the other hand, there are a great many people . . . whose thinking on educational procedure is on a general and abstract level, and who are unwilling to apply techniques of measurement and the like to verify their generalizations.

"Some of the principals and teachers in the so-called progressive schools have little patience with any attempts at measurement. They are applying a point of view without verifying its effectiveness in practice."[2]

The crux of the problem before us seems to lie in the meanings that we are to give to the terms philosophy, science, and research. The principal effort accordingly will be to clarify these terms. After that will follow a study of their mutual relations and interrelations. In conclusion, specific attention will be given to the opposed views involved in the quotations given above.

THE TERMS PHILOSOPHY AND SCIENCE

Lying at the bottom of our inquiry, as I see it, are three fundamental problems of life and education which may be distinguished as follows:

A. What shall I do?

This is the inquiry which one puts to himself when he faces a situation of doubt as to what policy to adopt or line of conduct to

[1] A paper read February 24, 1931, before the Detroit meeting of the American Educational Research Association. The original talk was from notes. It here appears somewhat amplified.

[2] W. W. Charters to the writer under date of December 8, 1930.

pursue. We may call this the conduct policy determination problem.

B. How shall I do it?

This is the inquiry which one puts to himself when he faces a situation of doubt as to how best to execute the decision reached in (A) above. We may call this the problem of practical execution or of administration.

C. If I do this, what will happen?

This, as will later be developed, is an auxiliary question which one will put to himself if he deliberates carefully on either (A) or (B).

Most readers here will probably recognize problem (C) the more readily if it be thought of as the question which an experiment is intended to answer. Some, accordingly, may prefer to word it: When such-and-such named conditions hold, what state of affairs may be expected to follow? However it be stated, this as will appear is the problem which carefully enough pursued leads to what we call science.

There is no claim here that these three problems are the only important questions that may be asked. It is claimed, however, that these three do continually present themselves in life so significantly that they can neither be denied nor ignored, while at least two of them are crucial to the task of this paper.

Problem (A) arises as we confront in doubt some novel or difficult situation involving various possible alternatives. Competing plans of action present themselves. Not all of these plans can be followed. We must choose. Problems of this type arise very, very frequently, but in this paper we shall be most concerned with the more complex instances where varied and more or less disparate values are involved, and this in such fashion that the various competing proposals make different provision for these values. One plan would, if followed, conserve one set of values, but deny others. A competing plan would better conserve the values denied by the first. In fact the conflict between the competing plans lies exactly in the different dispositions they propose to make of the varied values or interests involved. It is under such circumstances that the typical question (A) is felt and we ask: "What shall I do?"

An example of type (A) may help us to identify it. Suppose a schoolman confronts the question as to whether French should or should not be included in a certain curriculum, and if yes, how much of it. Clearly in such case there are competing plans (some already actually in mind, better ones perhaps yet to be contrived). Each such plan favors

certain values more or less at the expense of others; and the values are diverse, apparently disparate. How, for instance, shall we weigh the "cultural" value of French literature or an "interest" in French civilization against the "practical" values of domestic art since (let us further suppose) we seem compelled to choose between them? The process of solving problem (A) involves typically the following steps: (1) the forming of many possible curriculum plans (hypotheses), any one of which promises in some sense or degree to meet the situation; (2) the asking as to what consequences may reasonably be expected to follow respectively from each of the competing plans; and (3) the weighing, somehow, of these several sets of expected consequences (values allowed or denied) against each other; (4) the winning out of one plan over the others in finally stimulating action, which means in common language that a "choice" has been made.

It is at once interesting to see that step (2) in the solution analysis of this problem (A) is exactly an instance of problem (C). If we allow four years of French, what will happen? If we give only three years to French, thus allowing one year of domestic art, what will result? How would it be with two years of each? What results may be expected from only one year of French? Each of these is a clear-cut problem (C): If I do this, what will happen?

The relationship here found between problem (C) and problem (A) is not an accident. No significant instance of problem (A) can be found whose consideration does not involve one or more instances of problem (C). While problem (C) is the kind when appropriately pursued leads to science, it is of course not true that all instances of (C) need be pursued with precise scientific precautions. Some may be too easy or too trivial. It must, however, be emphasized that the differences in kind here seen between problems (A) and (C) and the functional need which (A) has for (C) are crucial facts underlying the discussion herein presented.

As regards problem (B) with its relationship to problems (A) and (C), this will better appear in an instance where execution is more obviously a problem. As an example, let us suppose that an eastern college faculty has already faced the (A) type question: What policy shall we adopt about admitting high ranking graduates of public high schools? And suppose further that the decision has been reached to admit without examination all such graduates as stand in the highest seventh of their respective classes. Then will follow (in substance) the

(B) type question: How shall we administer the new policy? For present purposes it is not necessary to pursue the differences between problem (A) and problem (B). At least this will be admitted, they represent different stages in the development of the situation of admitting high school graduates. It is, however, important to note that problem (C), which we saw appearing as an auxiliary constituent in problem (A), will similarly appear repeatedly in any attempted solution of problem (B).[3] If we accept the unsupported certificate of unknown high school principals, what will be the results? If we adopt an accrediting system, what will be involved? As we found with problem (A): there is an essential difference in kind between (B) and (C), and problem (C) is as an auxiliary inherently necessary to any solution of (B).

Problem (B) we can now drop from further consideration. Its introduction has, I hope, served its purpose. But the distinction between problems (A) and (C) is so important to our inquiry that we must pursue it further. Possibly in the end, problems (A) and (C) will appear as complementary aspects of any vital question.

As between problems (A) and (C) two differences have so far appeared: (i) they ask essentially different questions, and (ii) (C) is an essential constituent in (A). There are still other differences which either accompany or follow from these two.

1. Problem (C), in a sense not true of (A), contemplates but part of a situation, problem A, in a sense not true of (C), involves the whole situation.

It seems clear that any (C) type inquiry, everywhere, takes a defined part or aspect of a situation and regarding this part asks precisely as to the sole fact of outcome: As regards this stated aspect, apart from all the rest, what will happen here? If pupils should study two years of French under these conditions, what will be the results from it? So far as concerns this particular question at this time, we are ignoring domestic art and the comparative values of the two-year French output and all else. It is only the fact as to what output is here to be expected that now concerns us.

We may go further. A (C) type conclusion is of the form: If X, then Y; if such-and-such named conditions X holds, then thus-and-such named state-of-affairs Y may be expected to follow (to within a certain

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[3] I wish to acknowledge the help I have received at this point and elsewhere in this paper from my colleague, Professor R. B. Raup.

named degree of probability). Thus a (C) type conclusion (of the form: If X, then Y) while it perhaps arose as a question in a particular concrete situation, when it comes to the investigation, cuts itself loose as best it can by a "separation of variables" from all else, so that as far as possible conditions X, and those only, are operative. In this way it may be possible (such is the aim) to say in conclusion: If and when conditions X hold, then state of affairs Y may be expected. The "if X, then Y" has thus in the end become true generally, because we were able, directly or indirectly, to let conditions X be the sole determinants. As an illustration, the inquiry which ultimately led to the "law of falling bodies" arose in connection with actual objects falling through the air, but the final statement (the "law") was true for physical bodies falling freely in a vacuum. Whether or not a true vacuum could ever be found was not at issue. Problem (C) thus (typically) arises as a specific part or aspect of a specific situation, and desirably for science the solution is general. Conditions X (physical bodies falling freely in a vacuum) are thus if possible stated absolutely, abstractly, generally, apart from any actual specific situation. Under such conditions, Y may reliably be expected. So much for (C) and how it contemplates one part or aspect of a situation.

Problem (A) is in these respects quite different. As a rule it is constituted in and of a particular concrete situation and is to be solved in terms of that taken as a whole in its total setting. In determining upon a policy or line of conduct under such conditions, all the significant efforts of all the possible plans (so far as we can get at them with all their ramifications) are factors to be taken into account in the determination of the policy. Problems (C) and (A) tend thus to move in two quite different directions. Problem (C) begins confessedly as part of a situation and besides tends to cut itself loose from any one concrete location in time and space and relationship and thus to become abstract and general. Problem (A) contrariwise faces a concrete whole situation. It tends by closer analysis to locate itself more and more intimately into the particular concrete situation with all its ramifying consequences (as far as it seems wise to pursue these). The respective conclusions of (C) and (A) show when reached the same contrast. Conclusion (C) concerns only part of the original situation and tends to be stated in precisely described terms and thus to hold "in general," independently of particular time and place. Conclusion (A) concerns this whole situation and holds only of it, of this particular concrete situation located here

and now, admittedly and consciously so complex as practically to defy description. As a conclusion it is thus local, particular, and limited, concerned with this one unique situation taken as a whole. The "spirit" of the conclusion may be applicable to other situations, not so (in general) with the precise conclusion.

As our study in this paper has to do with education, it may be well to note that any actual educational situation is essentially and inherently particular and never general. It is: What shall we do with *this* child or with *this* class *to-day* or with *this* school? General considerations may be useful, but in the end—whenever application is to be made or actual education is to go on—it is always a particular concrete situation with which we have to deal. Whoever deals educatively deals always with one or more persons—specific actual individual persons, not statistical averages—and these persons are here and now located within this special social situation and setting. The actual educational task is thus always concerned with the (A) type problem, either to ask it or (having asked and answered it) to administer or execute the answer. And in education both this and the executing must go on in terms of the whole situation in a sense never true of the (C) type problem or procedure.

2. Problems (C) and (A) take essentially different attitudes toward allowing interest to affect the result.

In order that problem (C) may be properly solved all interest in one result over another must be rigidly excluded from the processes of obtaining the result. If I am a physician to my friend, I must not let my love for my friend enter as a factor in determining the diagnosis. Whatever disease my friend has must be determined in entire independence of whether I love him or not, and of however disastrous the suggested disease may threaten to be to his life.

But an (A) type problem is different. I am trying to decide upon a proper policy, trying to decide what to wish in the light of all my wishes, what to wish in terms of all my wishes. The effort at solution lies then first along the line of seeing all the interests which may be affected one way or another by all the proposed plans, and second of finding or devising a plan that will, all things considered, best conserve all the interests affected. In other words, while the (C) type problem would cut out interest in result from affecting the result, the (A) type problem, contrariwise, seeks to have all the interests as such to play each its own proper part in determining the result, in order that the net result shall be that which in the end is most desired.

A very ordinary instance will show the play of interests in making plans. Suppose a lady is planning a dinner party. The (positive) wishes in connection are many, with actual hazards (negative wishes) also present. The lady plans to meet her wishes (interests). Where the wishes do not conflict, no choice is necessary, the resulting plan will include all such. Where the wishes do conflict, the effort is precisely to see what "after all" she does wish. Throughout the whole process, the clear endeavor is to give sway to wishes as far as this can be done.[4]

3. Questions (C) and (A) accumulate characteristically different techniques for attacking their respective problems.

What constitutes the (C) type resources is familiar enough. Especially to be included are all those techniques ordinarily comprised under the head of scientific method, such as the separation of variables, control groups, statistical procedures, random sampling, controlling the variable, precise terminology, elimination of bias, objectivity, etc., etc. These and their like with our accumulated stores of pertinent knowledge constitute the (C) type resources. They have been devised through a long succession of closely criticized efforts at establishing reliable expectations as to observable phenomena.

The (A) type accumulated resources are characteristically different. Concerned as they are with reaching dependable decisions as to conduct and policy, they have to do with the values of life (interests, consequences to life) and how to deal intelligently with these. Three levels of accumulation we may distinguish: First are those terms and distinctions for noting and discriminating the many actual varied interests and values of life. These we may think of as relatively distinct from each other and constituting, as it were, the raw material of conduct and policy decisions. Second, come certain strategic conceptions for picking out values or groups of values which experience has shown to have outstanding significance in conduct or policy decisions, such as the common virtues like honesty or kindliness and certain broader generalizations like "respect for personality," "freedom of speech," "intelligent self-direction," James's "universe with the lid off," inherent change, events in process, becoming (vs. being), precariousness, etc., etc. Third, we have that more or less inclusive and unified point-of-view on life, which—always in the

[4] There is to be sure another way of looking at the matter, a sense in which (A) is like (C). The process of finding what "after all" to wish is not itself arbitrary, if properly done it follows inherent logic. But this in no wise invalidates what is set out above. The essence of solution (A) is to give every wish its *due* place.

making—represents the more or less organized deposit of successive (A type) decisions on conduct or policy. If the lowest level represents relatively single and isolated human values and interests, and the second the classifying and grouping of these under strategic heads, the third level is the aggregate of all life's values so far as the individual concerned has organized these into a criticized working whole to serve as the initial basis of attack upon any new (A) type problems which may confront.

All three levels represent accumulations of our civilization in this field. Each one individual does in fact always have and use a stock of these, well or ill made. But quality is highly significant. The individual can no more do without the best of the social inheritance here than he can in other fields. The strategic importance of (A) type decisions in education as in life demands the conscious and critical effort of the educator to avail himself of the best that civilization has here accumulated.

To be prepared for attack upon (A) type situations there is need, moreover, not only of the resources peculiarly characteristic of problem (A) but as well the techniques and results peculiar to (C). For we need to keep ever in mind that the (A) procedure as we saw above, always involves the (C) procedure as part and parcel of its own operation.

4. The results of the (C) and the (A) type solutions tend to differ in permanence, as to degree (not kind) of permanence of result.

The (C) type conclusions are in a sense more permanent than are the (A) type. The reasons are by now obvious. The (C) type problem has dealt with a part or aspect of a situation, simplified and abstracted so as to be at once describable, easier to work with, and more general in character. The (C) type conclusions tend then to be general and are often highly reliable. While mistakes are not unknown, many of these conclusions seem practically settled as far ahead as we can now see.

The (A) type conclusion is, by contrast as we have seen, local, particular and limited. It has to do with an actual unique life situation. It is true that many situations present so nearly the same significant factors that conclusions of policy reached in one situation will often apply with little change to the like factors in other situations. But life as we know it is notoriously on the go. New factors are continually arising. Each new situation needs to be examined to see what significances it uniquely holds. Conclusions of policy then, being the correlatives of unique whole situations, are as we seek to use them in new situations much more subject

to change than are (C) type conclusions of abstract and general fact which may and do enter as elements in many situations.[5]

Now that we have more fully contrasted these (A) type and (C) type procedures, we may explicitly rename them to fit the more ordinary terminology.

When any person or group faces a difficult situation and asks, "What shall we do?" "What policy shall we adopt?" there confronts what we have here called an (A) type problem and situation. If now such an (A) type problem be highly complex, especially if it involves disparate values, and if the problem be treated very carefully and in the light of the historic accumulation and criticism of thought in this field, then we say that the problem is one of "philosophy" and its treatment is a "philosophic" procedure. It is clear then that every one faces many, many (A) type problems. Of these, many are sufficiently complex to be called "philosophic." But treatment by "philosophic procedure" will be less frequent. Every school administrator thus faces many problems "philosophic" in character, but whether he applies to them a "philosophic procedure" is another and different matter. Under such circumstances, the difference between a rough and ready, common-sense procedure and a philosophic procedure is one of degree.[6]

Similarly with (C) type problems and procedures. Each person faces many, many such each day. If the problem is sufficiently difficult and if it be attacked with sufficient care, the appropriate procedures historically accumulated and criticized being used, then we call the problem a scientific one and say that it is being attacked in a scientific manner or by scientific processes or procedures. Whether to call it common sense or to call it science is similarly again a matter of degree.

With these definitions of philosophy and science it becomes clear that they are not antagonistic but complementary processes. Life and education need both.

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[5] That a scientific (C type) generalization is highly reliable carries with it of course no guarantee of proper use. When to use such and how can only be answered in terms of the practical analysis of the particular complex situation at hand. As any chain is no stronger than its weakest link, so here the use of the highly reliable "fact" or "law" gets its reliability not from the "fact" or "law"—however well these may have been established—but from the success in solving the immediate practical problem.

[6] This distinction is not always made. Freeman, Frank N. "Teaching as an Applied Science," *Educational Method*, IX (May, 1930), 452. Also the same author, "Scientific and Philosophical Methods in Education," *Science*, LXXIII (Jan. 16, 1931), 55.

THE MEANING OF RESEARCH

The next concern in our inquiry relates to research. What is research and what relations do we find between it and philosophy and science as above defined?

The term research is a fairly old term and antedates the exclusive claim to it now made by some in behalf of science. The root notion seems to be that of very careful study and search. The facts seem to demand at least two types of research, the older one being fairly close to what I have called the (A) type procedure. For purposes at hand we may distinguish these two types of research as follows:

(C) type research: an extended instance of careful "scientific procedure" applied with originality. This factor of originality may be questioned, but it seems usually implied. This type we may call scientific research.

(A) type research: a careful and extended study—analytical and critical, and possibly constructive—into records or experience as such but done from the point of view of (A) type inquiry or interest. This we may call philosophic research.

Since some more familiar with the pursuit of science than with the history of thought have doubted the existence of this second type of research, it may be well to illustrate it. Take for example an (A) type research into educational objectives. This might include a comparative and critical study of different theories of such objectives as appear in our educational literature. The criticism of these could well go on in the light of the best available theories of the social process, of the educative process, and of the relations of the two. The guiding aim would be to propose if possible a better conception and scheme of educational objectives than any now available. An actual study along this line now in process promises when completed to show striking connections hitherto little seen between social attitudes and educational theories as actually held by American educators. That this is an (A) type question and that it involves, if well done, true research none would deny. There is possible in it any amount and degree of actual reading and original study and thought. A smaller instance of (A) type of research is the study actually made within this paper of the terms Philosophy, Science, and Research. Another still smaller, but true instance would be the study made for this paper of the historic dictionary meaning of the term research.

THE RELATION OF PHILOSOPHY TO SCIENTIFIC RESEARCH

We are now at length ready to come to grips with the problem principally set by the makers of this program. As originally worded, the topic was, "The relation of philosophy to research." But since the question in mind was clearly the relation of philosophy to scientific research (as above defined), the word scientific has been inserted into the title as it appears at the beginning of this article.[7] We may now state the problem perhaps more precisely as, "What are the relations between philosophic procedure and scientific procedure in the study and management of education?"

Possibly to many the most important issue here has to do with facts. First of all, does philosophy claim for itself some short-cut road to facts? The answer is a categorical NO. This cannot be too emphatically stated. Fact finding is a (C) type procedure and by whomsoever done must be pursued according to the best available (scientific) safeguards. Philosophy (if it does not propose to establish by scientific procedure the facts it would use) must get the facts which it would or should use exactly as does any intelligent scientist when he would use facts which he is himself not going to establish. This means, as I understand it, that any one, whether acting as philosopher, scientist, or layman, must get facts which he is not himself to establish from the best available authority and to this end must consult the best available and most reliable sources of information. Here as always we must respect on its merits expertness in its own field. Philosophy is no more a makeshift fact-finding agency than is science itself when depending on prior established facts.[8]

It ought to be said, however, in connection that the philosophic procedure will scrutinize very closely all alleged facts. It will be very sensitive to discover any possible biases or unexamined presuppositions that may be involved in the finding or statement of such facts. All probable presuppositions and all *obiter dicta* given out in connection with the publication of fact findings will be especially scrutinized to see whether some bad philosophy may not be masquerading under the name of science. As any and all science whatsoever stands upon philosophic assumptions of one kind or another, the need for this precaution becomes

[7] Apparently the author of the original title assumed, probably unconsciously, that scientific research is the only kind.

[8] This point is made emphatic because of certain attacks that have been made on philosophy. Kelley, Truman, "The Scientific versus the Philosophic Approach to the Novel Problem," *Science*, LXXI (March 21, 1930), 295-302.

the more necessary. ¿In a word, all good philosophizing takes its facts from the best available scientific authority, but only after the closest scrutiny.? And good philosophy does not hastily conclude that all the evidence is assembled. It knows too well the history of thought to fall easily into this error.

But philosophy has still other relations with facts. Philosophizing as herein conceived is essentially a careful effort at establishing policies or decisions of personal or social conduct. Any deliberation as to policy or conduct will necessarily assume certain facts to be true and on this basis reach its conclusion. Anything then that will change the facts assumed at that time to be true may well change the decision as to conduct or policy. Such a change of facts may come about either by a change of situation (which is going on all the time) or by increase of knowledge which may upset hitherto accepted facts. Science then may by changing our knowledge change hitherto accepted facts and so call for a revision of prior accepted philosophic opinion. This has frequently happened and in an infinite universe may be expected to happen until the end of time. Such a conclusion is neither a surprise nor a disappointment. It is of the very nature of philosophic opinion and judgment that, like our world itself, they are always in process of remaking, and—also like our world—with growth and accumulation.

But there is yet more about facts which the philosophic procedure must consider. Certain seeming opinions to the contrary notwithstanding, facts are not just bare things, standing alone, true independently of all else, waiting in such independence to tell us what to think. Whatever else may be said about facts, they are noted or seen as such only in relations, actual or possible. One sees things as facts only because there are already present certain outlooks of theory and interest to which these things as seeming facts have pertinence. It is not necessary here to discuss how facts are always so selected because of apparent possible or actual pertinence or how it thus becomes quite erroneous to speak of getting "the facts" first and only afterwards constructing "theories." What is more significant to us here is to note that "facts" to be reliable have to be established and that the process of "establishing" a fact necessarily establishes it in and for that relationship and not, necessarily, in or for any other. That is to say, what is proved in one limited relationship need not remain true when other factors are introduced and the relationships are thus changed. Changed factors and relationships call for a new consideration before we can assert truth or falsity. Apart

from such a reconsideration we simply do not know whether the original conclusion does or does not hold. From this point of view "facts" as actually reported lose somewhat of the almighty sovereignty often attributed to them by careless thinkers. We have to know the conditions under which the alleged facts were established.

The considerations of the preceding paragraph when given their proper range of generality prove highly significant. They set a very far-reaching limitation upon all propositions counted proved in a simplified situation. Such propositions may be true and remain true whenever the identical simplified conditions are alone in operation; but they may be quite different when even slight changes are introduced. In ordinary mathematics and physics or other very simple situations this limitation upon applicability of a proved proposition is not so often called into play as in more complex situations. In astronomy the earth approximates an elliptic path in spite of attractions from other sources than the sun, but this is only a seeming exception. Even more in psychology and education may slight changes make "all the difference." And here again is the actual educational situation always specific. No "fact" or "law," however well established, is certainly pertinent or applicable until after a consideration of the specific situation. Again is the chain no stronger than its weakest link. The limitations herein put upon the possibility of a "science of" education are very great, apparently insuperable. The "case study" method may prove to be the only reliable procedure for dealing with actual situations.

We are now ready to draw the first general conclusion regarding the relations between philosophy and scientific research, or more perhaps exactly between, philosophic procedure and scientific procedure. In general, we may say, their relations are determined by their mutual functions as follows:

It is the business of scientific procedure to ascertain and state as reliably as possible "facts" and "laws" (the reliable uniformities and expectations among phenomena), and along with these whatever can be stated as to the range within which such may be expected to hold. This is a (C) type problem and must be done with due care according to the best available (C) type (scientific) techniques and criteria.

But it cannot be too emphatically stated that "facts" and "laws" of themselves do not suffice for life. Experience, as we have seen, continually presents problematic (A type) situations calling for appropriate action. Until we think through these situations, weighing alternatives,

considering consequences, etc., we cannot act intelligently. For this we need, to be sure, certain pertinent "facts" and "laws," but these are data with which and about which we think. They are to be taken into account along with all the other pertinent considerations. Forming an integrated (A type) decision as to conduct or policy involves and uses facts, but is itself quite a different process from establishing facts. Among other differences, one stands out. The "principles" or criteria which one uses in judging in this field are—like the context words used for understanding a new term—themselves in part remade in the process. Such judgment forming seems in fact *sui generis* and as such has developed its own safeguarding techniques. Any one who undertakes to think through such a problem—layman, scientist, professional philosopher—is under obligation to learn and apply the best available safeguards for attacking such problems. As the "philosophic" procedures cannot ignore the safeguards that have been devised to make fact-finding reliable, so the scientist in his conduct or policy forming decisions cannot ignore the safeguards of "philosophic" procedure. The obligation is reciprocal and mutual.

THE RELATION OF MEASUREMENT TO THE TESTING OF GENERALIZATIONS

Let us now try to conclude by applying the discussion thus far made specifically to Dr. Charters's points. These seem, by a legitimate condensation to reduce themselves to these two:

I. "There are scientific workers who have no place in their thinking for formal philosophy, . . . who . . . feel that philosophy has no value for them."

II. "On the other hand, there are many . . . who are unwilling to apply techniques of measurement and the like to verify their generalizations . . . They are applying a point of view without verifying its effectiveness in practice."

Let us consider these in the order given.

I. Will those who have hitherto thought they had no place for philosophy reflect upon the following considerations found either explicitly or implicitly in the foregoing discussion?

1. Each competent person is continually called upon to make decisions as to conduct and policy. It is inevitable. The process involved is essentially that of integrating initially discordant interests as far as possible into one working whole, an accepted purpose.

2. This kind of decision making is *sui generis*. In particular it is not the same as fact finding or "law" establishing, though it will make use of both. Nor is it the mere bringing of facts and laws together. Rather is it somehow getting all conflicting interests into one working whole so that we may more surely act satisfactorily.

3. This inevitable problem unique in kind may, if properly practiced and studied, be expected to leave successive results in the mind and disposition. The contrary would be most remarkable. In fact, each one does store up such results according to the work done on them and is thus always forming an ever growing point-of-view. And this point-of-view does in fact affect all the pertinent decisions that one makes.

4. If these things be so—and they cannot, it appears, be denied—then it would be further remarkable if the conscious study of such viewpoints should be without effect: How points of view are made; how they work; how they differ; how different viewpoints have differing effects on life and on education. Might not the intelligent study of these thus show how to better review and possibly revise one's own point of view?

5. And surely, since one's inclusive viewpoint does affect all one's conduct or policy decisions, criticized points of view will in the long run serve better than those held in ignorance. And if criticism is desirable, surely conscious criticism with the help of an expert in the field will be better than mere haphazard criticism, conducted in ignorance of what good thinkers in the field have brought together.

Some seem to think of philosophy simply as *a priori* systems founded on dialectic juggling. Possibly some past philosophies have thus sinned. But the conscious criticism of conceptions and points of view in the light of pertinent outworkings is quite another matter. It is as feasible as it is desirable. There need be no more *a priori* or dialectic juggling in it than in scientific thinking. The past sins of philosophy are bad, very bad, somewhat like those made in science before Copernicus, Galileo, and Newton. If science has learned better, why refuse the possibility to philosophy?

6. It is thus not a question of philosophy or no philosophy. Each one does have a philosophy. Denial simply means that one will not look at it. The only question is whether one shall be content with a philosophy he just happens to have or whether he will become conscious of his philosophy, take it in hand, and try to improve it. Shall education accept a philosophy built on mere tradition and prejudice and held more or less

unconsciously, or should it seek consciously to make a better philosophy using the best available expert criticism?

II. Now we turn to those who refuse to "apply the techniques of measurement and the like to verify their generalizations," who wish to apply a point of view "without verifying its effectiveness in practice."

Here we face the rub: Does "verification," with measurement as the means thereto, apply equally to all generalizations?

The term "verify" as it appears in the complaint demands scrutiny. Recall the old catch, "Have you stopped beating your wife?" To it one can neither answer yes nor no. Either entraps. The question itself, in advance, presupposes the entrapping state of affairs. So here with the term "verify." Its meaning exactly and exclusively fits those generalizations where measurement does test. If we admit the term "verify," we have allowed the contention. Generalizations, it appears, are of two kinds. There are generalizations of which we properly ask the question, Is this statement (generalization) true or not? Of these "verification," as the etymology implies, is the proper term for their validation or testing, while measurement (if available) is the proper means to be used. But when we face a decision (generalization) as to conduct or policy, we do not ask, Is it true? But rather, Is it right or just or proper or fitting? For these, "verification" is not the appropriate term with which to describe their testing or validation, nor (as will in a moment appear) is measurement adequate as a testing procedure.

Let us repeat this examination a little more carefully. So far as concerns the opinion of this writer, it is impossible to state too strongly the doctrine that any and all generalizations must be tested by the way they work when actually tried out. But generalizations seem clearly to admit of (at least) two classes. First are those, as with scientific "laws," which are in effect prophecies of what to expect when conditions are changed in stated fashion. Boyle's law thus tells us what changes to expect in the volume of a gas when, "under standard conditions," a known change is made in the pressure upon it. Clearly if the prophecies thus made cannot stand the test of "verification," the alleged "law" is a false prophet and must be rejected. And in connection, the techniques of measurement and the like are simply refined ways of verifying. If available, they must be used. Wherever, then, as in science, the essence of the generalization is a simple prophecy of what to expect, "verification" is an appropriate term and the demand for it is imperative, while

measurement (if available) is appropriate and even obligatory. So far there need be no disagreement.

But, as was indicated above, not all generalizations are simple prophecies. Some—specifically those embodying decisions as to conduct or policy—involve an element quite different from mere prophecy, namely, the element or aspect of rightness or fitness or propriety. For these it appears that measurement as such does not suffice to test. A conduct or policy decision is specifically an aim which, if chosen suitably, represents our wish or will, our effectual wish after all available pertinent considerations have been taken into account. Such a decision, made necessarily in advance of trial, represents our wish as we see things before trial. How then shall we test this decision? Certainly by actual trial. What part has measurement to play in this? Situations differ. It well may be that measurement suitably applied will help us the better to see and appraise certain outcomes (these, be it noted, are never single). Does now the knowledge of these measured outcomes cause us to confirm, reject, or modify the policy as originally fixed? The only way (in general) of answering this question is by asking, "What do we now wish in the light of all that we now have before us?" But clearly the consideration of this question is the same kind of (A type) procedure by which the original decision was made. In other words, we test a decision as to policy or conduct by trying it out, getting all the data we can as to how it works, and then decide by a repetition of the original process whether we now wish to continue or to change the policy under review. Measurement when available is an appropriate help for getting more accurate data to use in a fresh appraisal, but the reappraisal proceeds as do all determinations of policy.[9]

The following conclusions to the two questions seem then forced upon us:

I. Any one who in his thinking has no place for his own actual working philosophy is simply refusing to open his eyes to a most significant factor at work in his own thinking and conduct. So to refuse with consequent refusal to examine and criticize is in effect to prefer ignorance to knowledge.

[9] Some may instance cases where the measured results sufficed to lead at once to a choice between questions of policy. There is no doubt of such cases, but these are "the exceptions that prove the rule." The new found or more accurate data, simply furnish the basis for a more easy choice. This is exactly how science gets in its proper work, not by superseding or supplying conduct or policy decisions, but by supplying better data on the basis of which better decisions can be made.

II. As to testing generalizations. All ideas or theories or generalizations of whatever kind,—proposed or adopted plans or policies as well as alleged or accepted "laws" and "facts,"—all must be tested by the way they work out in practice. There is no escape.

But as to using techniques of measurement and the like for such testing, two cases present themselves. Wherever, as in science, the generalization is in essence a simple prophecy it must stand or fall by its success in prophesying. For all such, "verification" is an appropriate term and measurement (when available) is a proper means of testing. The situation, however, is different where, as with decisions on appropriate conduct or policy, we face not a simple prophecy but instead an aim or chosen end, an effectual and final wish in the light of foreseeable consequences. For the testing of these, "verifications" is not an appropriate term and techniques of measurement are not in themselves adequate. In such cases, the function of measurement is not to supplant or to supply decisions, but to furnish, regarding the working of the policy under review, more and better data, in the light of which a fresh and better decision can be made. The testing of decisions of policy or conduct is indeed by trial, but the trial and its results demand an appraisal which is in kind simply a choosing *de novo* of what now to wish. So far as at present appears, the testing of policies as such lies forever beyond any mere process of measuring.

THE PRESENT STATUS AND SIGNIFICANCE OF MANUSCRIPT WRITING

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Manuscript writing is not, as is generally supposed, a new type of simplified handwriting. Nor is it necessarily a crutch to be taken up and laid aside in the acquiring of a legible cursive hand. Manuscript writing is a revival of the original handwriting from which all present print and handwriting forms have evolved. To add to its significance it has a precedent of centuries of legible and beautiful handwriting preserved from the past. The Carolingian writing of the eighth century, and the fifteenth and sixteenth century manuscripts of the Italian Rennaissance are the particular models which have been found most practical upon which to base a simple rapid and legible handwriting for present day use.

Our present cursive writing has been termed a deterioration of the original handwriting through the invention of the copperplate, which was the only means known at the time of the revival of learning to make sufficient copybooks to supply all who wished to learn to write. The engraver could manipulate the finely pointed tool with greater ease by not lifting it from the plate throughout a word, thus departing from the clear separate forms of the original letters and creating the joining strokes and loops of cursive writing. Though all of the fine unnecessary loops and flourishes to which copperplate engraving lent itself have since been discarded, all subsequent reforms in cursive writing have been in the direction of simplifying and adapting copperplate writing rather than in a return to the basic principles upon which natural writing by hand was originally developed. Whether or not this course is to be lamented, certain it is that the characteristics of many individual letters are impaired through the joinings, and it is common knowledge that in rapid cursive writing the distinguishableness of entire letters is often completely lost.

The chief recommendations of manuscript writing are its legibility, beauty, and the ease with which it is acquired. Other points advanced in favor of manuscript are: (1) young children can produce better results; (2) manuscript causes the beginner less fatigue; (3) it eliminates the learning of a separate alphabet for reading and writing; and (4) children with poor muscular control can produce readable results. These

points are substantiated by a survey made at the Horace Mann School of Teachers College.[1] The survey reports an additional significant observation, namely, that "manuscript writing meets the needs and interests of children on their level of development," by this is meant that in the case of beginners it is quickly learned and may be used with satisfaction for their first writing needs of labeling and making sentences. As the child progresses through the grades the writing is adaptable not only for practical writing, but it suits his purposes for book making, poster making, artistic lettering, and many unforeseen uses which occur in the pursuit of his activities. Teachers in both England and America agree also, that the neatness and legibility of manuscript writing may be utilized for a decided influence upon the care with which written work may be done.

Speed tests of manuscript writing are not conclusive, though significant results have been obtained. Several tests were made in England from 1913 to 1916.[2] A group of tests given by Dr. Kimmins, Chief Inspector of the London County Council, showed an advantage in speed of manuscript over cursive at all ages up to fourteen. The writing at the time was also reported as more legible. Similar experiments in the Leeds Schools showed manuscript to have an advantage in speed of 12.0 manuscript letters per minute over 8.5 letters for cursive in Standard I, with practically no difference between manuscript and cursive in Standard VI. In the Leicester Schools in 1918 a class of children age 13 were taught manuscript writing for one month. At the end of that time comparisons were made of their manuscript in composition with their former writing. Results recorded showed: (1) striking improvement in legibility, (2) saving of space amounting to 10 percent for the whole class, and (3) a slight diminution of speed amounting to 10 percent. One school in Leeds used manuscript writing in note taking for several years and cursive for all other writing. When tested their manuscript writing proved to be much faster than cursive.

A significant experiment in this country is that made by Dr. Reeder of Columbia University in the Horace Mann School.[3] The experiment

[1] Unpublished survey made by Penmanship Committee of Horace Mann School of Teachers College, by means of a questionnaire answered by sixteen elementary and ten high-school teachers, 1928.

[2] Tests reported in Board of Education Pamphlet, published by His Majesty's Stationery Office, London, England.

[3] Reeder, E. H. "An Experiment with Manuscript Writing in the Horace Mann School," *Teachers College Record*, November, 1926,

showed that efforts to speed up writing in the fourth and fifth grades were decidedly more successful with manuscript than cursive and at the same time manuscript maintained its quality. Arthur I. Gates and Helen Brown of Teachers College found "print script" writing, employing both up and down strokes, more satisfactory in speed for grades below the third and cursive for grades above the third.[4] Manuscript writing, however, which according to tests is more rapid, uses only down strokes.

Edith U. Conard and Elizabeth J. Offerman made a study of teaching manuscript writing to adults which showed that it can be acquired easily and quickly, even though, as in the case of adults, writing habits are already formed.[5] It was also noted that learning manuscript writing improved the form of the cursive writing originally used. Speed and quality compared favorably with that of the former writing.

Manuscript writing was revived in England over thirty years ago with a view to simplifying handwriting to meet the needs of children. Nine years ago it was introduced into the United States from England. After a reasonably prolonged trial, it becomes incumbent upon those who are interested in handwriting teaching to inquire into the present status of manuscript writing. In so doing questions arise as to (1) its growth in use, (2) the types of schools in which it is taught, (3) the extent to which it is continued in schools that have introduced it, and (4) the practices followed in its introduction and teaching. The facts of this study are reported as they contribute to the answering of these questions and to the general understanding of the significance of the use of manuscript writing.

Questionnaires were sent to practically all schools in the United States teaching manuscript writing. Schools were located through companies supplying manuscript writing materials, teacher training schools, state policies regarding handwriting, supervisors and superintendents of recognized progressive school systems, and letters sent to a list of schools supplied by the Progressive Education Association. Of the original total of 230 questionnaires sent out, usable returns from 164 schools (71 percent) were received. Thirty-three schools reported not using manuscript writing; one school reported refusal to answer questionnaires; thirty-two schools were not heard from.

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[4] Gates, A. I., and Brown, Helen. "Experimental Comparisons of Print Script and Cursive Writing," *Journal of Educational Research*, June, 1929.

[5] Conard, E. U., and Offerman, E. J. "A Test in Speed and Quality of Manuscript Writing as Learned by Adults," *Teachers College Record*, February, 1930.

The questionnaires were answered by persons holding various positions, and having experience with the teaching of manuscript writing for varying lengths of time. Seventy-eight (47.6 percent) were answered by school principals; sixty-seven (40.8 percent) by teachers of manuscript writing; fifteen (9.2 percent) by writing supervisors, and two (1.2 percent) by superintendents. The longest experience with the writing was reported by three individuals to be ten years; the shortest reported by five individuals was three to six months. For the remaining persons the length of experience ranges from one to nine years, with a median somewhat over three years.

Manuscript writing was first introduced into this country simultaneously by several teachers of New York schools in 1920 and 1921. One school, however, notes the introduction of manuscript writing as early as 1900. This school is probably indicative of the existence of other schools that devised a type of manuscript writing for its practicability before the impetus was felt from the English movement. No schools reported as having adopted the writing during the period from 1900 to 1920. From 1920 a steady increase is indicated, showing the greatest number of schools to have introduced manuscript writing in 1924, 1925, 1926, and 1927. In the years 1928 and 1929 there is a decrease in the number of schools introducing it. (Chart I) The marked increase in the year 1923, and following, is probably due to the visit of Miss Marjorie Wise of England in 1922, and her course in manuscript writing instituted at Teachers College, Columbia University, that year.

The evidence shows a marked increase in the amount of teaching of manuscript writing by schools since its introduction. It would seem to indicate, however, that there is a tendency toward a decrease in the number of schools introducing it since 1928. This might be interpreted to mean that manuscript writing was a fad which reached its height during the period from 1924 to 1928. However, since a minimum of schools intend to discontinue it, it is more probable that the number of schools experimenting with manuscript writing was nearing a saturation point in 1928 and 1929, and that a further definite increase would not set in till the precise values of the writing had been ascertained.

Approximately three times as many private as public schools have introduced manuscript writing. Of the private schools answering, eight are demonstration schools in teacher training institutions; six are outstanding experimental schools; thirty-six are listed as progressive schools by the Progressive Education Association, and the majority of the re-

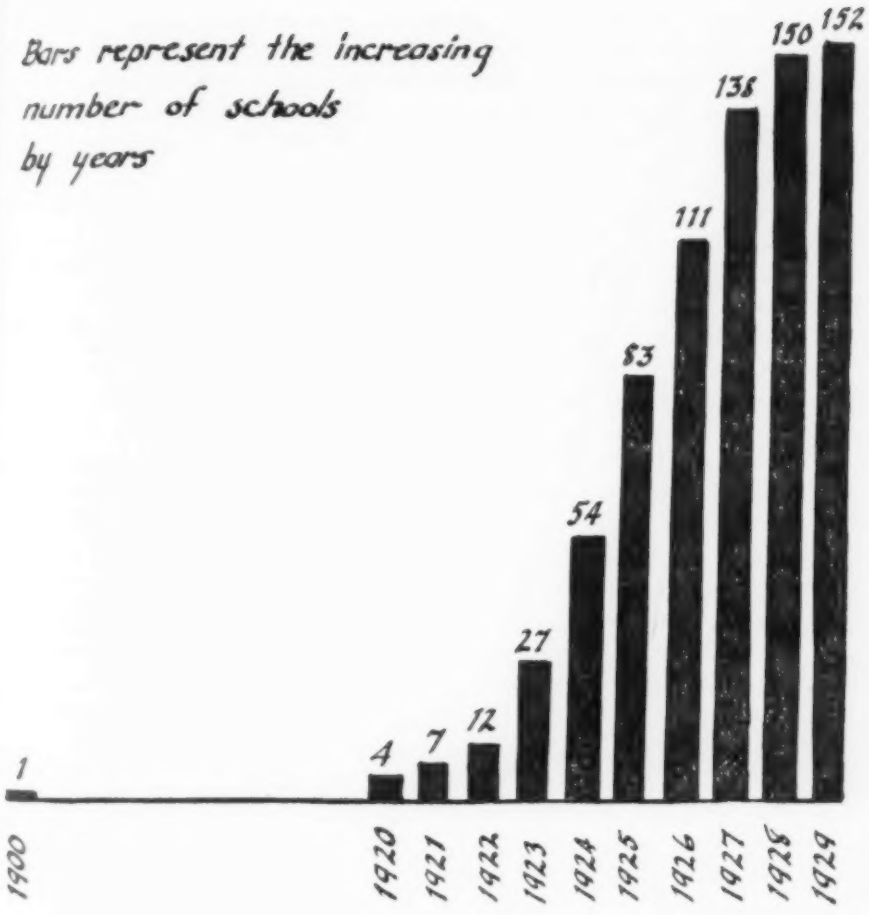

Chart I. Increase In Number Of Schools Adopting Manuscript Writing Since 1900

mainder have a reputation for the excellency of their work or their comparative age and stability among private schools.

Of the five schools having introduced and discontinued manuscript writing, three are public, one private, and one a special school for subnormals. Of five schools reporting "discontinuing it in some grades," all are public. One school reporting "discouraging it," is a public junior high school. One public school reports "investigating manuscript writing but county forbids introducing it."

As may be expected from the need for experimentation in manuscript writing a preponderance of the schools using it are private. Both public and private schools reporting are sufficiently free from inflexible administration to carry on experiments in education.

It is exceptional for a school to discontinue manuscript writing after it has been introduced. Practically all schools that have adopted manuscript writing prefer its continuance to a return to the cursive method formerly taught. Of the total number of schools reporting, one hundred and fifty-seven (96 percent) report their intention of continuing it. Only five schools have tried and discontinued it. One school reports investigating, and one doubtful. These data are more significant in the light of the fact that the letters sent to schools reported as using manuscript writing particularly emphasized that their answers to the questionnaire would be valuable whether they had discontinued its use or not.

The reasons given for continuing manuscript range from "manuscript writing forms an excellent basis for cursive; there is no poor longhand to unlearn after the second grade," to "we have found manuscript writing highly satisfactory and entirely adequate for all our needs."

The questionnaire noted four possible reasons for discontinuing manuscript writing: "slow," "lacked individuality," "teachers not trained," and "parents objected." Of the five schools having tried and discontinued manuscript writing, two gave "slow" as one of their reasons; two others gave "teachers not trained." As individuality is certain to develop in a mature handwriting, it is not surprising that only one school checked lack of individuality. Apparently in no case was "parents objected" considered sufficient reason for discontinuing manuscript, though objection of parents is reported as being a genuine obstacle by many who intend to continue it. Three additional reasons for discontinuing manuscript writing were each given once by three of the five schools: "penmanship teaching discontinued," "upper school teachers

objected," and "a new supervisor was secured who did not approve it." It is significant that manuscript writing continues to be taught in practically all schools that have introduced it despite the pressure of prejudice in favor of the accepted cursive form of handwriting.

Furthermore, manuscript writing was to be taught in more grades in 1929-30 than 1928-29. The total increase proposed for all schools reporting is fifty grades. The increase is more marked since the figures include the several schools now teaching manuscript but intending to discontinue it in the future. The tendency to decrease shows only in the first grade. The tendency to increase is more marked in the sixth, seventh, and eighth grades; the proposed addition of sixth grades being eight in number, of seventh grades, ten, and of eighth grades, ten. The fourth, ninth, and twelfth grades follow with a proposed addition of five grades each. (Table I)

TABLE I

TEACHING OF MANUSCRIPT WRITING BY GRADES COMPARED FOR SCHOOL YEARS 1928-29 AND 1929-30

Grades	1928-29	1929-30	Increase
1st	139	138	—1
2nd	131	131	0
3rd	111	112	1
4th	92	97	5
5th	82	83	1
6th	73	81	8
7th	33	43	10
8th	22	32	10
9th	12	17	5
10th	9	11	2
11th	5	9	4
12th	4	9	5

Comments indicate that the tendency to increase the number of grades in which manuscript writing is taught may be due to various factors such as: (1) more attention is paid to keeping manuscript writing up to standard, (2) manuscript writing adequately meets the handwriting needs of the child, obviating the need for teaching a cursive method, (3) manuscript writing is taught in the upper grades to those individuals for whom it is a more adequate style of writing, (4) instruction in manuscript writing is frequently resorted to in the upper grades to correct the faults of poor cursive writers.

As the classes using manuscript writing progress out of the lower grades, the problem arises as to whether they shall continue to write manuscript. The procedure followed depends less upon test findings than upon individual conceptions of the value of manuscript writing. Some schools regard manuscript writing as an adequate handwriting

tool, teaching it to the exclusion of any other type of writing. Others regard it as valuable chiefly for bridging over beginning writing till a definite cursive method may be successfully taught.

There is a decided trend toward continuing manuscript writing, or a cursive or semi-cursive form evolved from it, in the upper grades. Only forty-five schools teach a definite cursive method to succeed the teaching of manuscript. In thirty-five schools it is Palmer method, in 6 Zaner, in 3 Economy, in 1 Leamer. Two schools report "teacher's own method." The remaining schools teach only manuscript or a style based upon it. Forty-two of these continue with a type of cursive or semi-cursive writing evolved naturally from manuscript by individual pupils. Thirty that teach manuscript in from 4 to 8 grades do not teach any more writing but indicate in comments that pupils are encouraged to keep their manuscript writing up to standard. Four schools teach manuscript writing throughout twelve grades. The forty-three schools remaining do not report any further procedure beyond the manuscript grades.

It is considered sufficient then, to teach manuscript exclusively in a large majority of the schools. In the upper grades there is a definite trend toward connecting some or all of the letters. This may be an adjustment for speed or a conforming to accepted handwriting form. Comments report observation that cursive or semi-cursive writing evolved from manuscript in the upper grades preserves more of the distinct characteristics of individual letters, showing the influence of a long period of imaging the separate letters in their precise forms.

One of the chief factors for consideration in understanding the present status of manuscript writing is that of the preparation made for its introduction into the schools. One hundred sixty schools made provisions for the change in handwriting teaching. They range in adequacy from securing copybooks for the use of the children to organizing a special class in the school for teachers under the instruction of a manuscript writing specialist. Only two schools considered it sufficient to secure manuscript writing copybooks for the children. One of these was the single private school to report discontinuing manuscript writing. From one to four of the other provisions were made in the remaining schools. (Table II)

Fifty-three schools made special provisions not listed. Forty-two of these concerned preparation of teachers such as, "A specialist in handwriting made experiments in this school and instructed the teachers in the principles of manuscript writing;" "One teacher studied with Mar-

TABLE II

FREQUENCY OF VARIOUS PROVISIONS MADE FOR INTRODUCING MANUSCRIPT WRITING

Material secured for teachers to learn for themselves	84
Special class in the school for teachers	45
Teachers attended class in training school	19
Special teacher secured for children	26
Children given manuscript writing copybooks	63
Other provisions	53

jorie Wise and supervised writing in the primary until teachers became familiar with it." Other provisions listed were, "A careful survey of handwriting was made before introducing manuscript writing into the school." "Meetings were held for parents and teachers to discuss merits of manuscript writing and papers were secured from other schools."

Thus it appears that the majority of schools made adequate preparation for entering upon an intelligent trial of manuscript writing. Without exception, all schools in which adequate preparation was made teach it in a comparatively large number of grades and intend to continue it.

Teachers of manuscript writing have been charged with enthusiasm for a writing which they believed would teach itself. If by this is meant that the fascination of writing manuscript has been utilized as motivation for practice, there are grounds for such a statement; if, on the other hand, it implies that teachers of manuscript believe that practice may be dispensed with, it is not substantiated by the facts. Practically all schools provide for definite drill periods, though there is evidence that they are more readily motivated than the traditional writing drill period. Comments indicate that manuscript fits well into a plan for improvement through purposeful writing, but this is not generally conceded to take the place of drill.

In the questionnaire, drill periods are defined as time for making preparatory motions, copying letters, parts of letters, sentences, or other formal practice, not in itself useful, except for improvement of writing. Eighty-three schools report formal drill periods to be necessary. Thirty-five schools report that after the manuscript letters have been taught, practical situations (letter writing, composition, etc.) give sufficient opportunity for supervised practice without formal drill periods.

The comparison of the time spent in drill on manuscript with that on cursive reveals that the largest single group of schools, fifty-two in number, reports the same number of minutes of drill for each. The second largest group, twenty-one, reports that drill time varies according to individual need. Eight of these schools believe that individual need

should be the determinant of drill time for all writing; thirteen feel it to be true of manuscript in particular. The third largest group of sixteen, reports definite drill time for manuscript but does not report for cursive, probably indicating that the individuals answering have had no experience with cursive writing. Eleven schools report less drill necessary for manuscript than cursive. Comments indicate that in these schools drill is motivated through practical daily work of individuals in such a way that formal drill is reduced to a minimum necessary for maintaining high standards. Eight schools report regular drill time necessary for cursive and unnecessary for manuscript with comments indicating that after the manuscript letters have been taught, drill may be motivated entirely through practical situations. One school reports more specific drill time necessary for manuscript than for cursive.

The evidence reveals then, that with a possible minimum of exceptions, all schools indicate the need for drill on manuscript, either formal or motivated practice for a class or individuals. The largest group reporting states that formal drill periods are indispensable. All but eight schools report that drill periods of a formal or informal nature are necessary for manuscript writing. Of this group three indicate in comments that drill is not indispensable, but should be motivated through practical situations. Certain factors definitely condition the report on drill, such as size of classes, methods of teaching, and conceptions of handwriting teaching.

As manuscript writing may be said to be in the experimental stage, one of the chief objects in the schools using it should be to compare results with the old writing by testing. It was to ascertain the extent to which this is done that a question on tests was included.

One hundred twenty-seven (85 percent) of the schools report testing some phase of the results of manuscript writing. The most frequent testing reported by eighty-nine schools is to make comparisons of legibility in manuscript writing and cursive; the next most frequent tests were made by sixty-six schools to compare the two types of writing for individuality; the third by fifty-nine schools to test speed; the least frequent by forty-three schools to determine the influence of manuscript writing on spelling.

While speed of manuscript writing has been one of the most contested points, it is not the most frequently tested. This may be due to familiarity with the results of tests made by experts, or to satisfaction

with a slight increase in writing time which is more than compensated for by a decrease in reading time.

There was a range of testing from one of the types of tests in two schools to all four in twenty-four schools, with two in thirty-five schools, three in thirty-one, and tests not listed on the questionnaire reported by thirty.

Other tests reported are: (1) comparing speed with the norm for grade, (2) determining influence of manuscript writing on reading, (3) determining the difficulty with which children writing only manuscript read cursive for the first time, (4) influence of position of pen on hand and body, (5) comparing fatigue in manuscript writing and cursive, (6) rating accuracy, neatness, word spacing and letter spacing, (7) determining effect of manuscript writing on continuity of thought. One experimental school reports: "A sample of each child's handwriting (grades 1-9) is taken under standard conditions once a year." Another experimental school reports: "Samples are taken of the children's writing three times a year. The samples are taken for the purpose of making a tentative scale."[6]

Comments indicate that many schools recognize a need for further testing. The results of tests are frequently volunteered in letters accompanying the questionnaires. A scientific attitude is indicated by requests for a report of this study and notification of tests and other investigations of manuscript writing.

Due to the prevalence of testing and the experimental attitude toward manuscript writing, some significance may be attached to the opinions required of these schools upon points in favor and opposed to manuscript writing. Practically all agree that it is more legible than cursive, that less time is consumed in teaching beginning reading and writing when a similar alphabet is used for both, and that manuscript is easier to acquire. A large majority have observed that children will write manuscript longer and with an apparently decreased amount of effort, and that the neatness and legibility of the style increase care for accuracy in all written work. A slight majority have found the children who write manuscript having difficulty in reading cursive though most of these note that several lessons in reading cursive remove the difficulty if the cursive writing is legible.

[6] Standards showing progressive steps in quality of manuscript writing have been constructed. See article by Conard, E. U. "Manuscript Writing Standards," *Teachers College Record*, April, 1929.

A majority of schools believe manuscript writing to be slower than cursive after the primary grades without special emphasis on speed. Tests of manuscript writing do not bear this out. It may be explained by the type and direction of the strokes taught and the extent to which they interfere with rhythm, or an undue emphasis upon quality at the expense of utility during the teaching years.

SUMMARY

1. There has been a marked increase in the amount of teaching of manuscript writing since its introduction, though it is confined to schools that are free to experiment in education.

2. Practically all schools that have introduced manuscript writing intend to continue it.

3. Manuscript writing is not only proposed for continuance in the grades in which it is now taught but there is a tendency for it to spread into higher grades.

4. A large majority of schools teach manuscript exclusive of a cursive method. Many of these schools consider manuscript a good basis upon which to make the natural joinings for a cursive or semi-cursive style in the upper grades.

5. The majority of schools made adequate preparation for introducing the teaching of manuscript writing, which partially insures an intelligent trial of the writing.

6. The need for drill in the shape of formal or motivated practice periods is recognized by practically all schools with a possible minimum of exceptions.

7. The tendency to test the results is indicative of an experimental attitude toward manuscript writing.

8. The preponderance of opinion favorable to manuscript writing in the schools using it is significant for its continued use.

A TECHNIQUE FOR MEASURING THE VOCABULARY BURDEN OF TEXTBOOKS

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AMONG the important factors that should be considered when selecting a textbook for high-school use is that of vocabulary burden. It seems evident that ease of reading and understanding the words of a textbook is an important index to its learning difficulty. A few studies have been made previously in this field.

LIMITATIONS OF SOME VOCABULARY STUDIES

Lively and Pressey[1] selected one thousand word units from each of sixteen different types of reading material. These words were then assigned the values given in Thorndike's *Teachers' Word Book*,[2] and comparison was made on the basis of total values for each type. Their method seems to be very effective for the comparison of the vocabulary difficulty of texts or of the vocabulary burden of units equal in length. It fails, however, to consider the extra burden imposed on the reader by additional length.

Dolch[3] makes a very good point in working out a ratio between the number of different words to the number of total words in a book so as

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[1] Lively, Bertha A., and Pressey, S. L. "A Method for Measuring the Vocabulary Burden of Textbooks," *Educational Administration and Supervision*, IX (October, 1923), 389-98.

[2] Thorndike's *The Teachers' Word Book* is an alphabetical list of ten thousand words which were found to occur most widely in a count of about 625,000 words from literature for children; about 3,000,000 words from the Bible and English classics; about 300,000 words from elementary school textbooks; about 50,000 words from books about cooking, sewing, farming, the trades, and the like; about 90,000 words from daily newspapers; and about 500,000 words from correspondence. Forty-one different sources were used. A measure of the frequency of each word's occurrence is given by the credit-number following it. If this credit number is 49 or over, it means that the word is in the first 1,000 for importance. A credit-number of from 29 to 48 places it in the second 1,000. A credit-number from 19 to 28 places it in the third 1,000, and a credit-number of 14 to 18 places it in the fourth 1,000. A second column is given in the *Word Book* which indicates by number the thousand in which the first five thousand fall. It also indicates by the letters a and b whether the word is in the first or second half of that thousand.

[3] Dolch, Edward William. "Vocabulary Burden," *Journal of Educational Research*, XVII (March, 1928), 170.

to take into consideration word repetition. He suggests that the book having the wider range of vocabulary is certain to possess a vocabulary farther from the region of everyday language. This is undoubtedly true in the majority of cases, but it would not seem to be necessarily an absolute fact.

Ward[4] took the total count of words in a section of a text and compared it with the Lively and Pressey method. He found a wider range of words in the total count and assumed that a thousand word count would not be a sufficient measure of any book. Since he has attempted to compare the results of two different techniques, it does not seem that he has proved his point. The average difficulty of words within samples would seem more desirable as a basis for comparing the vocabulary difficulty of one book with that of another than would the extreme ranges of words within the whole texts.

It is not to be expected that, in any sampling method, we will arrive at results which we can set up as a fixed standard. Instead, we should only expect to arrive at results on various texts, which, when compared, would bear the same ratio as would a comparison of burdens of the entire vocabularies of these texts.

A SUGGESTED TECHNIQUE

The following is suggested as a desirable technique for measuring the factor of vocabulary burden of high-school textbooks written in the English language. This technique was developed and used in a research project at Indiana University, in which all state-adopted texts for Indiana, with the exception of foreign language texts, were measured.

LENGTH OF TEXT MUST BE CONSIDERED

Word samples were taken from each of the texts studied. Since some of the books are considerably longer than others, it did not seem quite fair to compare their reading burden by selecting a definite unit of words from each book as a sample. The length of a book would undoubtedly affect the vocabulary burden of that book as compared with other books of different lengths. Where the difficulty of the average word is approximately equal, it, at least, is a greater task to read a long book than it is to read a short one. Also, by taking a definite unit, we

[4] Ward, J. L. "Measuring Vocabulary Burden," *American School Board Journal*, LXXI, page 98.

would not take into consideration the proportional repetition of these words in any other unit similarly selected from the same text.

Thus, the different words in a one-thousand-word unit from a short text might bear a lower ratio to the total one thousand than the different words in the entire text might bear to the total words in it. In other words, the longer the text the greater is the probability of its having a high percentage of word repetition. By taking a definite percent sample from each text, the ratio of different words to total words in the sample would be more nearly representative of the actual ratio of different words to total words in the entire book. It, therefore, seems that a proportionate word sample is the only valid sampling basis for comparing texts of unequal length, and that the results so derived are more reliable than where a definite unit is used.

SELECTION OF THE SAMPLE

In order to get what was considered a fair proportionate word sample from each book, the words from the third line of each fifth page were listed. If this were not a full line, the next full line was taken except in cases where the previous five pages were partly given over to pictures, graphs, diagrams, etc. If this piece of line seemed to be proportionately comparable to the amount of printed matter on those pages, it was used. When the fifth page was given over entirely to non-printed material, then the next printed page was sampled; the regular order, however, was resumed in taking the succeeding samples. These words were then tabulated alphabetically and their frequency numbered as they appeared in each sample. The number of words then in each list was the number of different words in each sample. This was called the range of the words.

USING THE TEACHERS' WORD BOOK

Each of these different words was then looked up in Thorndike's *Teachers' Word Book*. The values that Thorndike had estimated were set down opposite each word in column arrangement, as is shown in the sample following.

The figures in the column at the left indicate the frequency of the word as found in this word sample. The figures in the first column to the right indicate the word value or the Thorndike-index number. Where there are figures in the next column the first figure to the left represents the ranking of a thousand of the most common ten thousand words to which this particular word belongs; the letters *a* and *b* indicate whether

it belongs to the first or the second half of this thousand; and the number at the right, when such number is found in this column, indicates the quarter of that thousand into which the word falls.

SAMPLE PAGE OF WORD SAMPLE TABULATION

F.	Word	T.I.N.	Position of in thousand	W.V.
14	are	181	1a1	2534
1	accounts	63	1b	63
41	and	210	1a1	8610
61	a	208	1a1	12688
1	against	114	1a1	114
1	Archimedes	0		0
1	acetylene	0		0
13	as	204	1a1	2652
8	at	203	1a1	1624
2	atmosphere	11	5b	22
5	air	91	1a4	455
1	also	119	1a2	119
3	another	116	1a2	348
1	attached	20	3b	20
1	apparatus	7		7
2	arrange	35	2b	70
1	away	125	1a2	125
1	absorbed	8		8
1	aids	47	2a	47
1	along	99	1a3	99
1	animals	70	1b	70
1	act	70	1b	70

A WORD WEIGHTED VALUE

In the last column we find what we have termed a weighted value of each word. This weighted value is a product of the Thorndike-index-number and the frequency of the word in that particular sample. We might represent this by the following formula: $W.V._{1} = T.I.N. \times F.$ In this formula, W.V. represents the weighted value; T.I.N., the Thorndike-index-number; and F., the frequency. The purpose of calculating such a weighted value is to take care of word repetition within the sample, permitting each word to be considered in proportion to the frequency of its use.

DIFFICULTY VARIES INVERSELY WITH RECORDED VALUES

It must be borne in mind that Thorndike's index numbers were based largely on the frequency of the use of the words included in his *Word Book;* the higher the value which he places on a word, the more commonly that word is used in everyday language. The lower values found through-

out this study, then, indicate a greater difficulty, or a greater vocabulary burden; that is, the difficulty or burden varies inversely with the values recorded.

COMPARISON OF AVERAGE WORD DIFFICULTY

The next step undertaken was to calculate an average-word-weighted-value so that it would be possible to compare the average word difficulty of one book with that of another as accurately as this is possible by a sampling method. This was done by totaling the weighted values for all words of a sample and dividing the result by the total number of words in the sample. This might be represented by the formula: $A.W.W.V. = \frac{T.W.V.}{T.W.S.}$ In this formula, A.W.W.V. represents the average-word-weighted-value; T.W.V., the total weighted values; and T.W.S., the total words in the sample. It can be readily seen that this average-word-weighted-value is merely the arithmetic mean of the Thorndike-index-numbers for all words of the sample.

INCLUSION OF THE RANGE OF THE WORDS

This average-word-weighted-value, however, does not seem to be quite a fair measure for the total burden of one book as compared with that of another, since it does not take into consideration the relation of the number of different words, or range, to the total number of words in the sample. We would not know whether the A.W.W.V. was the result of a few words used a number of times, or whether it was the result of a number of different words of about the same degree of difficulty used only a few times each. The reader will undoubtedly concede that the latter would be the greater burden, and that it would be especially noticeable in reading a long book of such proportionate range.

In order to take this range of words into consideration, an index number was found by dividing the average-word-weighted-value by the range of the words within the sample. This gives the ratio of the different words to the difficulty of the average word, as is shown in the following example:

Text	T.W.S.	R.	T.W.V.	A.W.W.V.	I.N.
Book I	646	379	77.045	119.26	.315
Book II	1051	433	125.289	119.20	.275

In this example, T.W.S. equals the total words in the sample; R. equals the range; T.W.V. equals the total weighted value; A.W.W.V. equals the average word weighted value; and I.N. equals the index

number. It can be readily seen that, in the sample given, the A.W.W.V. is approximately equal in both books, but that Book II is considerably longer and has a larger range of words; consequently its reading burden would be heavier. By dividing our A.W.W.V.'s by their respective ranges we reduce these books, which have approximately an equal A.W.W.V., to index numbers which include not only the weighted values of the words, but also the total words in the sample and the range of these words, varying inversely with the latter; that is, the larger the range, the smaller is the index number, indicating a greater reading burden. We might develop this into a formula, as follows:

$$\text{A.W.W.V.} = \frac{\text{T.W.V.}}{\text{T.W.S.}} \qquad \text{I.N.} = \frac{\text{T.W.V.}}{\text{T.W.S.}} \div \text{R. or}$$

$$\text{I.N.} = \frac{\text{T.W.V.}}{\text{T.W.S.}} \times \frac{1}{\text{R}} \quad \text{or} \quad \text{I.N.} = \frac{\text{T.W.V.}}{(\text{T.W.S.})\ \text{R}}$$

This same process should give satisfactory results in all cases.

A SUB-CLASSIFICATION OF THE SAMPLE

Each sample list was next gone over, and the number of words found in each of the first three thousand was totaled, as well as was the number of those found between the third and tenth thousand, and of those which were not found at all in Thorndike's most common ten thousand words. The last group were called the zero value words, since there were no values listed for them. Each of these numbers was then divided by the total number of words in the sample in which it was found in order to determine the percent which each was of the total. This can be used to compare the difficulty of the words in each book according to their distribution. It will also help to clarify the meaning of the index number which was first determined as well as to serve as a check on it.

DETERMINING THE MOST DIFFICULT YEAR OF SCHOOL

Another phase of the procedure was the sending out of a questionnaire to one hundred commissioned high schools in the state of Indiana. These schools were selected by taking every eighth commissioned high school, regardless of size, from the Indiana state school directory. The apparent range was from the smallest to the largest commissioned high schools of the state.

The final form of the questionnaire resolved itself into a check list containing the names of the forty-three different texts adopted by the state, and space for the checking of those used within the school and for

checking the year or years of school in which each was used. Replies were received from seventy percent of the schools. A tabulation of the results gave us the frequencies of the use of each text in each year of high school. By comparing this with our index number, as worked out in the first division of our procedure, we were able to find out in which year the texts having the greatest vocabulary burden were used.

In order that we might more objectively compare the difficulty of one year of high school with that of another, we worked out an average index number, or an arithmetic mean of the index numbers, of the total state adopted texts used in any one year. First, we multiplied the frequency that a text was used in each year by the index number for that text, deriving what we called a frequency-index-product for that text for each year used. The frequency-index-products for each year, as well as the frequencies of the use of state adopted texts in each year, were

SAMPLE OF TEXTBOOK CHECK LIST

		Year of H.S.			
		1	2	3	4
Our English					
Written and Spoken English					
English Literature	Clippinger				
Outlines of English Lit.	Long				
Outlines of English Lit. Readings	Long				
American Literature	Long				
Outlines of American Lit.	Long				
Outlines of Am. Lit. Readings	Long				
Early European History, Rev.	Webster				
Modern European History, Rev.	Webster				
Modern Times and Living Past	Elson				
History of the U. S.	Beard, etc.				
Government in the U. S.	Smith, etc.				
Elementary Principles of Chem.	Brownlee, etc.				
First Book in Chem., 1928 ed.	Bradbury				
Chemistry and Its Uses	McPherson, etc.				
Beginners Chem. and Its Uses	Irwin, etc.				
Elem. Prin. of Physics	Fuller, etc.				
Elements of Physics	Millikan, etc.				
Essentials of Mod. Physics	Dull				
Physics in Everyday Life	Henderson				
Commerce and Industry	Smith				
High-School Geography	Whitbeck				
First Course in Algebra	Nyberg				
Second Course in Algebra	Nyberg				
Modern Plane Geometry	Clark, etc.				
Modern Solid Geometry	Clark, etc.				
Arithmetic of Business	Smith				
Applied Arithmetic	Smith				
Farm Projects and Problems	Davis				
Animal Husbandry	Harper				
Soils and Crops	Mosier				
Studies in Horticulture	Lloyd				
Engineering on the Farm	Stewart				
Practical Botany (Agri.)	Bergen, etc.				
Plant Life and Plant Uses	Coulter				
Elem. Studies in Botany	Coulter				
First Course in Botany	Pool, etc.				
Textbook in Botany	Allen, etc.				
Animal Studies	Jordon, etc.				
General Zoology	Linville, etc.				
Healthful Living	Williams				
Practical Zoology	Hegner				

Please be especially careful to check whether you are using the text or would use it, if you were not using an old adoption, and whether you are or would use it in years 1, 2, 3, or 4.

then totaled. Finally these four total-frequency-index-products were divided by the total of the frequencies for their respective years. The result was an average-index-number which indicated the average vocabulary burden for each year of high school. We might also work this out as a formula, as follows:

B.F. $\times$ I.N. equals F.I.P., in which B.F. represents the book frequency; I.N., the index number; and F.I.P., the frequency index product.

A.I.N. equals $\frac{\text{T.F.I.P.}}{\text{N.}}$, in which A.I.N. represents the average index number or the arithmetic mean of the index numbers; T.F.I.P., the total frequency index products; and N., the total number of book frequencies in each year.

It is recognized that the measurement of vocabulary burden of high-school textbooks is only one of several desirable devices for ascertaining their relative suitability for class use. The foregoing method is presented only as an apparent improvement in technique in one phase of measurement of the quality of the texts. Methods of equal or better quality should be developed for evaluating other features that affect the worth of books as aids to learning.

SHORTER ARTICLES

A STUDY OF THE CONVERSATION OF FIRST GRADE PUPILS DURING FREE PLAY PERIODS

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A fertile field for the discovery of children's interests and needs is the natural and spontaneous conversation which can be observed in school and at home. The investigation reported here is a preliminary study to discover whether or not the activity that engages the attention of children has a direct influence upon the type of conversation carried on by them. A secondary purpose was to develop a valid procedure for collecting data for a more extensive study that may contribute to the solution of some of the language teaching problems in the primary grades. If there is a relation between the activities of pupils and their conversation, the fact should have direct bearing upon the selection of activities for a first-grade curriculum.

THE MAJOR PROBLEMS

1. What proportion of children's spontaneous talk is concerned with an audience, or, in other words, is really social conversation?

2. What activities, in which the pupils participate during their free play periods, stimulate the largest proportion of real conversation and are, therefore, most useful to teachers who aim to develop in their pupils the habit of considering their listeners when they speak?

METHOD OF PROCEDURE

This investigation was carried on among the thirty-two pupils of a first grade class in the Hawthorne School, Madison, Wisconsin. This school is situated in a district of representative American homes. The author, with a competent stenographer, visited this classroom during the free play periods for eight days. During these periods the boys and girls made their choice of activity without direction other than the stimulation provided by the equipment. There were available furnishings for a toy store, blocks for building, clay for modeling, balls, dolls, and games. The children were not self-conscious in the presence of the visitors. After one little girl had asked, "What are you writing down?" the group was told that we were writing down the things they seemed to like to do during the period. From then on, we were called upon

to appreciate their achievements and to share their interests. From these evidences we felt sure that our observations were not formalizing either the play or the conversation. While the stenographer recorded in shorthand the actual talk of the children, the author made note of the activity that was occupying the attention of the group.

When the reports of the stenographer had been collected, each statement was numbered and placed on a card with a note indicating the activity. The statements were then classified into the functional categories used by Jean Piaget in his book, *The Language and Thought of the Child*.

THE CLASSIFICATION SCHEME

Piaget's categories were determined on the basis of the child's purpose in making his comment. Two main groups were made: (1) egocentric speech, in which the child is not concerned about his hearer, and (2) social speech, in which he gives some consideration to his audience.

I. Ego-centric speech was divided into:
   1. *Monologue:* The child talks to himself as though he were thinking aloud. He does not address anyone.
   2. *Dual or collective monologue:* Although the presence of other people stimulates the comment, the point of view of the listener is not taken into account by the speaker. The audience is not expected to understand or respond.

II. Social speech was separated into:
   1. *Adapted information:* This is a real interchange of thought and communication of ideas. The child considers his listener in an effort to tell him something or to influence his actions or opinions. It differs from collective monologue in the apparent attitude toward the listener.
   2. *Criticism:* This includes all remarks about the work or behavior of others. They may imply the superiority of one person over another. This is distinctly social speech, because it is intended to provoke a response and usually does.
   3. *Commands, requests, and threats:* These are productive of response. There is interaction between pupils. All demands in the form of statements have been classified as requests, for instance, "I want those blocks."
   4. *Questions:* Most questions call for an answer, sometimes a nod, sometimes an action, and sometimes an actual remark. Ques-

tions have been, therefore, considered as social speech in this classification.

5. *Answers:* These are answers to real questions or to commands. It was sometimes difficult to distinguish this from *adapted information.*

THE FINDINGS

With some activities, such as playing with dolls, with marbles, making crayon pictures, making paper costumes, jumping in contests, playing with the magnet, or jumping rope, the amount of conversation secured was so small that percentages were not computed. The children's statements while engaged in these games were used, however, in estimating the totals given in the last column of Table I.

In Table I are summarized the results of the observations made while seven different activities or projects were being carried on. The percentage of the children's statements falling into each category has been given.

TABLE I

TYPES OF SPEAKING STIMULATED BY VARIOUS PLAY SITUATIONS

	Gathering Material and Organizing a Store	Playing with a Store Already Equipped	Building with Blocks	Organizing a Game with a Large Rubber Ball	Using the Stereoscope	Clay Modeling	Playing Ring Toss	Totals
I. Ego-centric speech								
1. Monologue	1.	4.9	2.5	3.7	17.6		57.1	7.7
2. Collective Monologue	6.	8.2	24.1	23.4	18.6	62.1	14.2	17.3
II. Social speech								
1. Adapted Information	25.	20.6	18.4	13.5	7.8	10.3		19.5
2. Criticism	5.	4.4	4.6	1.4				3.1
3. Commands, Requests, etc.	23.	18.1	29.8	46.9	21.8	14.1	17.8	25.7
4. Questions	24.	30.6	11.5	7.4	26.4	10.0	3.5	17.7
5. Answers	16.	13.2	9.1	3.7	7.8	3.5	7.4	9.0
Total percent of ego-centric speech	7.	13.1	26.6	27.1	36.2	62.1	71.3	25.0
Total percent of social speech	93.	86.9	73.4	72.9	63.8	37.9	28.7	75.0

The table above shows the relation of the different kinds of speech to the activities which stimulated the expression. The figures given are percentages.

Table I should be read, "While the pupils were organizing a store, one percent of monologue and twenty-five percent of adapted information was observed. While they were looking at pictures through the stereoscopes, seventeen and six-tenths percent of the talk was monologue and only seven and eight-tenths percent was adapted information."

In all the activities together twenty-five percent of the speech was ego-centric and seventy-five percent social conversation.

Although the observations were not extensive enough to indicate that the percentages above are the actual percentages which we may generally expect from these activities, yet the differences, particularly striking in the case of the store and the game of ring toss, indicate that the type of activity has a direct relation to the type of speech stimulated.

The fact that Piaget found a total of 39 percent of ego-centric speech for one child and 37 percent for the other child he studied, as compared with our result of 25 percent of ego-centric speech, may be due to the type of play going on. This is impossible to determine because, in *The Language and Thought of the Child*, the classification is not made with regard to the different types of activity.

SUMMARY

In the final study some changes will be made in the method of making observations and in the categories used. The major problems will remain the same, since sufficient observations were made to show that the activities of the pupils determine, to a large extent, the type of speech used, and that certain activities stimulate more speech of a social nature than others. The percentages in Table I, however, are to be considered merely indications of tendencies because of the comparatively small number of observations made.

1. According to our observations, about 25 percent of the total speech of these children was not concerned with the listener, but was virtually monologue. About 75 percent of the talking was done with the viewpoint of the audience in the mind of the speaker. These percentages would probably change if the group's activities were changed.

2. Those activities requiring coöperation, as illustrated by the store, stimulated the larger percentage of social speech, while those involving competition, illustrated by the game of ring toss, provoked a larger percentage of monologue.

SHALL THE I.Q. BE USED FOR SECTIONING IN THE HIGH SCHOOL?

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THE writer[1] has previously argued that in using an intelligence test for the purposes of grouping in the junior and senior high school, the

[1] Symonds, Percival M. *Measurement in Secondary Education.* New York: The Macmillan Company, 1927.

raw score on the test should preferably be used rather than the I.Q. Data recently obtained throw new light on this issue and the writer now believes that the I.Q. is preferable to the score for purposes of grouping in high schools. The data which throw new light on the problem are contained in the following table:

TABLE I

CORRELATION OF SCORES ON INTELLIGENCE TESTS AND IQ WITH ACADEMIC ACHIEVEMENT LATER IN THE YEAR

Achievement Test	Intelligence Test	N	Correl. with intelligence: Score	Correl. with intelligence: I.Q.
Stanford Achievement Arithmetic	Otis Self-Administering	34	.477	.553
Van Wagenen American History Information K-2	Otis Self-Administering	26	.446	.510
Powers Chemistry	Terman Group	62	.45	.39
Ruch-Cossman Biology	Terman Group	164	.508	.517
Haggerty Reading, Sigma 3	Terman Group	210	.567	.646
Hotz Algebra Equations	Terman Group	184	.343	.325
Ruch-Cossman Biology	Terman Group	300	.509	.524
White Latin	Terman Group	115	.369	.373
Hotz Algebra Equations	Terman Group	139	.445	.441
	Average		.457	.479

The difference is about .02 in favor of the I.Q.

Reference to the formula for correlations between ratios helps interpret the finding.

Adopting the following symbols: M.A.—mental age; E.A.—educational age; and C.A.—chronological age, the correlation between E.A. and I.Q. becomes[2]

$$r_{IQ \cdot EA} = r_{\frac{MA}{CA}\, EA} = \frac{\frac{V_{MA}}{V_{CA}} r_{MA \cdot EA} - r_{EA \cdot CA}}{\sqrt{\frac{V^2_{MA}}{V^2_{CA}} + 1 - 2\frac{V_{MA}}{V_{CA}} r_{MA \cdot CA}}}$$

$$\text{where } V = \frac{\sigma}{M}$$

Where $r_{MA \cdot EA}$ is taken at .60 and $\frac{V_{MA}}{V_{CA}}$ is taken at 2 and $r_{EA \cdot CA} = r_{MA \cdot CA} = .00$ the correlation between I.Q. and E.A. is .54 which is considerably lower than .60. When, however, the correlation between C.A. and M.A., also C.A. and E.A. is —.30 the correlation between I.Q. and E.A. rises to over .60. In short, if the grading is such that there is no

[2] This formula was derived by Dorothy C. Rowell from a formula originally given by Pearson.

Pearson, K. "On a Form of Spurious Correlation Which May Arise When Indices Are Used." *Proceedings of the Royal Society*, LX (1897), 489-498.

correlation between age and ability, then the raw score on an intelligence test is preferable to the I.Q. But under ordinary conditions the brightest pupils in a class, even in high school, are the youngest (correlation around —.30) so that there is a slight advantage to using age as well as ability in predicting achievement. There is thus an advantage of .02 to the I.Q. over the raw score on an intelligence test in predicting academic achievement.

The correlation of I.Q. with achievement acts like a *multiple correlation* as compared with the correlation of intelligence score and achievement, although the multiple correlation is multiplicative rather than additive as is usually the case.

It should be added that grouping should be by subject in high school wherever possible, and when this is done the intelligence test is not the best method to use in grouping. Achievement in a subject yields the highest prediction of future success in that subject. In case it is a beginning subject, a prognosis test or achievement in the most closely related subject taken the previous year gives the best predictive results. The intelligence test is always second best in any case, although if combined with these other factors it adds a little to the multiple correlation.

EDITORIALS

THE SCIENTIFIC METHOD AND CLASSROOM SUPERVISION

HUNDREDS of teachers, principals, special supervisors, and superintendents are about to start a new school year. Everyone wishes to make the year a good one. Many teachers, principals, supervisors, and superintendents have planned special programs for their own professional advancement and for the improvement of instruction. In many instances the interest of these individuals will be in scientific supervision. It is the purpose of this editorial to discuss briefly the scientific method and classroom supervision.

I should like to start this discussion by saying that there is nothing mysterious about the scientific method. It represents merely an unusually vigorous attempt to think correctly about the problems of everyday life. The problems of everyday life are infinitely complex, and the human mind exceedingly limited in capacity. The scientific method is merely a mode of rendering man's attempts at thought more effective. Common thought is subject to the following and many other limitations: 1. It frequently happens that people draw conclusions from incomplete data. The incompleteness of the data may be due (a) to the individual's inability to get all of the facts, or the facts may not be available; (b) to the individual's inability to see all of the facts, such as in instances of prejudice; or (c) to the individual's inability to keep all the facts in mind, because of the limited range of human attention. 2. It frequently happens that the means employed in collecting data, in the processes of ordinary thought, are subjective and impressionistic. In common thought one too frequently relies upon estimates, guesses, and subjective evaluations; consequently, one's conclusions are frequently erroneous. 3. It frequently happens in ordinary thinking that people fail to distinguish between the apparent and the real causes of phenomena. The antecedents of phenomena are usually exceedingly complex. In the absence of analysis, variation, and control one frequently mistakes results for causes, and inconsequential antecedents for potent factors. 4. It frequently happens in ordinary thinking that one accepts one's first generalizations as final and conclusive. The results are not checked as, for example,

one would check the correctness of a solution to a problem in arithmetic. It appears to be no mean accomplishment to view one's own conclusions as tentative and test them from many points of view. The scientific method is merely a collection of rules, devices, and instruments to overcome the more common imperfections of human thought. The subject itself is a very old one and by no means limited to the field of education. The best treatises on the subject will be found in the works of the logicians: Mill, Jevous, Bain, Westaway, Creighton, and others. The subject matter of logic, as almost everyone knows, is the study of correct modes of effective thinking.

Coming to classroom supervision, I should like to say that the central problem of classroom supervision is a problem in thinking: first, in determining the objectives of supervision; second, in determining the causes of various levels of pupil achievement; and third, in determining the effectiveness of supervisory programs. The search for the causes of unsatisfactory pupil achievement may be taken as an illustration. In this type of thinking one has observed an effect and desires to determine the cause (antecedent) or causes (antecedents) of the effect observed. This kind of thinking when pursued as a formal undertaking is usually called a causal investigation. One may conduct such an investigation for a given school population in general, or for specific teachers, pupils, or classes. If it is the purpose of the investigation to determine the causes of an observed effect for some school population in general, one would naturally employ one or another or all of Mill's five methods of inductive thinking: (a) agreement, (b) difference, (c) joint agreement, etc. If one's purpose is to determine the causes underlying a specific instance of poor work such as inability to multiply decimal fractions, one would proceed about as follows: (a) test the performance; (b) recall from conversation, reading, observation, and experience the most probable causes of poor performance; (c) from a knowledge of these causes and of the situation under investigation, choose one cause (or more) as the most probable cause (or causes) of the effect observed; (d) check for the presence or absence of the supposed cause (or causes); (e) remove the supposed cause; and (f) recheck the performance. A large part of supervision consists of thinking of this sort.

It is sometimes helpful to think of supervision as experimental thinking, as for example, single group experimentation. In single group experiments, one measures, introduces an experimental factor, and observes

the effect. In supervision one measures, searches for the causes of poor performance, institutes improvement programs, and measures the results. Most supervisors know very little about the effects produced by the programs of supervision that they employ. They merely supervise: that is, they merely perform the tricks that they have been taught to perform. They devise extensive programs of activities without knowing a great deal about the results produced by them. They are very much like bad boys pitching bricks over a stone wall into a crowd of people that they cannot see. In many instances supervision might be greatly improved if supervisors might think of supervision as experimental thinking. The reference here given has been of experimental thinking of the single group sort. Experimental thinking of other sorts are equally applicable.

The point of this editorial is that scientific thinking and scientific supervision are merely stubborn attempts at correct thinking. The scientific method is usually thought of as a highly formalized procedure, suitable only to educational technicians and the laboratory. It is almost never thought of as an informal mode of thinking suitable to the problems of everyday life. In the testing movement, for example, standardized tests were first developed; later some one got the idea of developing informal objective tests, utilizing the principle of scientific testing. One might entertain approximately the same idea relative to the scientific method. To date the scientific method has been restricted chiefly to so-called experts in research. It appears that its techniques might be generalized and made more universally available to all those engaged in problems of thinking. There is nothing mysterious about it; it is merely an unusually vigorous attempt to think correctly. It is eminently applicable to classroom supervision.

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REVIEWS

Address all communications relative to book reviews to Editor E. J. Ashbaugh, Miami University, Oxford, Ohio.

BLUEMEL, C. S. *Mental Aspects of Stammering.* Baltimore: Williams & Company, 1930. x + 152 pp.

This book is a supplement to a former work, "Stammering and Cognate Defects of Speech," by the same author, and after an interim of seventeen years spent in study and research, he says he has attained a "clearer insight into the problem."

The writer states as his proposition that "Stammering is an impediment of thought," that is, "We speak as we think." He points out very definitely the difference between physical manifestations and mental conditions. Fright, imitation, association with others who are afflicted, language difficulties, and illness have all been attributed as causes. There is no physical deformity, so there must be a mental factor. Among the physical manifestations are cited cases of stammering on musical instruments, typewriters and writing, as well with the speech organs. This is followed by a discussion on the body functions. He concludes part one of the book with the statement that "the task of the stammerer is not merely to tranquilize his mental speech but to tranquilize his mind and his body."

Part two, entitled "Thought Training as the Basis of Speech Correction," contains the therapy for treating stammering with the first proposition in mind. There is a series of graduated drills and exercises in thought training with definite directions for execution.

The book is written primarily for school use with elementary children, and is simple enough in language so that anyone old enough to read understandingly can use the material without the aid of a teacher. On the other hand, parents and teachers may be helpful to the child thus afflicted if they will familiarize themselves with the method of treatment and lend him sympathetic help.

In conclusion, the author says that "much work remains to be done in the field of speech correction, and this is chiefly of two kinds: research into the causes of stammering and methods of correction, and second, application of methods for the stammerer's relief." The privilege and responsibility of speech correction then, lies with the schools, and it is to be devoutly hoped that educators will give to the problem the earnest consideration that it deserves.

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TIEGS, ERNEST W., AND CRAWFORD, CLAUDE C. *Statistics for Teachers.* Boston: Houghton Mifflin Company, 1930. xii + 212 pp.

Students in colleges and universities frequently manifest considerable fear of courses which involve statistical procedure. Administrators and teachers

from kindergarten to graduate school are, taken as a whole, more likely to shy away from than they are to read educational literature in which statistical technique is included. Such antipathy is little less than tragic. Generally textbooks have presented the subject with considerable detail and in such abstract terminology as to frighten the average student or reader, or they have presented statistical procedures in such simplified form that most of their utilitarian significance has been lost.

This volume is relatively free of both of these difficulties. The authors have succeeded in presenting essential statistical concepts in their functional relationships as needed by administrators and teachers for use in educational procedure and for intelligent reading of educational literature. It is definitely addressed to unspecialized educational workers already in the field, and to instructors and students in classes where only the elementary principles of statistics are desired.

The book is divided into twelve chapters. The first chapter presents the reasons why individuals in all phases of educational endeavor should study statistics in a clear and convincing style. Chapters two through ten are concerned with the techniques of statistical procedure. The more commonly used processes are explained, demonstrated, and related with clarity and precision. The last chapter is a brief, but illuminating, discussion of the principles of statistical research. However, no attempt is made to explain research procedures. On the other hand, the chapter is an expository essay which should lead the reader to a broader appreciation of the purpose, nature and significance of research, and at the same time, it should cause him to realize that the principles and procedures set forth in the preceding chapters are sufficient only for understanding of research.

Following the last chapter is a list of twenty-one selected references. The difficulty of these is indicated by the designations, "Elementary" or Advanced." Names of publishers and dates of publication are given. The book is adequately indexed.

A number of specific virtues appearing throughout the book deserve attention. Each new concept or principle is introduced in relationship to those which have preceded it, and in terms of concrete situations wherein it is involved. Practice problems follow each explanation and demonstration, and are accompanied by devices for checking accuracy. Likewise, problems and exercises and a true-false test appear at the end of each chapter. The cumulative development of explanatory tables are particularly worthy of mention. They lead the reader through the various principles, step by step, and thus supplement the verbal expositions most vividly. Formulas are set forth without attention to their derivations, but the page numbers of other texts wherein they may be found are cited. Attention is called to the kinds of situations in which the techniques presented are most likely to be found, and warning is given that other techniques than those presented can oftentimes be used with equal effectiveness.

The book, as a whole, has been prepared with admirable skill and care, and undoubtedly fills a genuine need. The authors set forth their objectives very clearly in the preface, and realize them in the body of the work with almost complete accuracy. Faults due to choice of principles for treatment are practically negligible. The true-false exercises at the ends of chapters might well have been purged of the controversial issues which

occasionally appear. However, the number of such topics is probably so small as to be insignificant. In some cases, brief explanations of techniques not expected by the authors to be mastered by the elementary reader are just detailed enough to be exasperating. Other than these possible difficulties, the volume contains little that is subject to adverse criticism.

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NOLL, VICTOR H. *Laboratory Instruction in the Field of Inorganic Chemistry.* Minneapolis: University of Minnesota Press, 1930. ix + 163 pp.

This is a report of one of a series of studies undertaken as a part of the general program of the University Committee on Educational Research through its sub-committee on the Teaching of Science. The purposes of this study were: (1) to compare individual laboratory work with other methods of instruction, such as oral quizzes, recitations, and outside reading on the basis of "value to the student"; (2) to determine whether or not students who spend more time in the laboratory gain significantly more from the course than do students who do less laboratory work; and (3) to devise techniques for measuring, with written examination, the differences in attainment of students who have not had the same amount of laboratory training.

The introduction to the present volume gives a most satisfactory review of previous studies. The progress is in the direction of continual refinement of methods of study and the merit of the present report is in the contribution that it makes to refinement of experimental techniques. Some differences are reported but they are not large enough to cause any excitement.

The experimental work was done with beginning classes in chemistry at the University of Minnesota. Measuring instruments were constructed for the experiment, using what seems to be carefully refined and acceptable techniques. These instruments were (1) the Test of Chemistry Achievement (TCA) and (2) Tests of Laboratory Aptitudes (TLA). These were tested for reliability and validity using a variety of procedures. The statistical data show that TCA is a valid and reliable measure of achievement but the evidence is not so convincing that TLA is a good test of chemical aptitude. It is, however, a reliable measure of something but it seems to give no better correlations with other measures of laboratory ability than does TCA.

In one experiment, comparisons were drawn between two equivalent groups in which the instruction was in all respects the same except that one group had five hours of laboratory each week and the other group had three hours of laboratory instruction and one hour of outside reading on assigned topics. That is, one hour of outside reading was substituted for two hours of laboratory work. The students with more laboratory work made consistently, but not markedly, higher scores on the tests.

In the second experiment, one group with five hours of laboratory work was compared with a group having three hours of laboratory work and one of recitation. All other factors were kept the same. No significant differences were found in the abilities of these two groups to make high scores on the tests. A small number from the experimental groups were tested to measure retention after an interval of seven months. Again no differences were found. A check on the success of the students in subsequent courses showed no differences.

In a third experiment, comparisons were made of two equivalent groups in

which instruction was the same except that one was given three hours per week of laboratory work and one was given five hours per week. This differed from the preceding experiments in that no substitution was made for the reduced laboratory time. In this experiment significant, but not large, differences were found in favor of the group with more laboratory work.

The data in hand afforded a basis for comparison of achievement in relation to interest in chemistry as indicated by vocational choice, in relation to sex, and in relation to previous preparation in high school. Students choosing to major in chemistry do consistently, but not markedly, better in this subject.

The characteristic thing throughout is the fact that there are little or no differences between the groups. This suggests the conclusion that the instruments used in measurement are tests that are weighted in favor of the type of learning that comes from lecture and recitation procedures and textbook study. The changes in the teaching procedures are so small in comparison with the whole program of teaching that the tests are not sufficiently refined to detect differences. With Dr. Noll's work in the background, further studies of laboratory technique may properly take on a more analytical and diagnostic nature. Studies reported so far do not furnish any adequate support for the modification of common practices in laboratory teaching.

SAMUEL RALPH POWERS
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CRANDALL, ANDREW WALLACE. *The Early History of the Republican Party.* Boston: Richard Badger, The Gorham Press, 1930. 313 pp.

Does a political party have basic principles distinguishing it from others? Can a party's position on new problems be deduced with some certainty from its past record? An affirmative answer is strongly indicated by this survey of the Republican party from its inception in 1853 through the campaign of 1856. The party was formed not merely by those opposing the extension and even the continuance of slavery, but into its ranks also came the nationalist Whigs, the nativists of the Know-Nothing party, and the advocates of stricter regulation of the liquor traffic. The subsequent record of the Republican party in supporting federal centralization, protective tariffs, immigration restriction, isolation, avoidance of foreign entanglements, and prohibition is, therefore, consistent with the principles adopted by its organizers.

Some may explain this consistency on public policies as largely the influence of established principles conditioning the attitude of voters who, by inheritance and other forms of social pressure, came into the party's fold. They would say, for instance, that the party has stood for immigration restriction not because voters independently concluded that restriction is the correct policy and therefore became Republicans but because they were accustomed to support the Republican party they uncritically accepted restriction, and the party's leaders have not had to discard a principle that has nothing to support it except tradition.

A perusal of his interesting book is recommended to those disposed to accept the latter view. Here would-be leaders are shown attempting to organize the opposition to the dominant Democratic régime on almost every conceivable solution of the issues of the day. Those became leaders of a powerful organization who divined most clearly the trend of popular thinking. At least in critical periods, such as the one Mr. Crandall portrays, leaders seem to reflect rather

than to direct the formation of political principles.

It should not be inferred from the foregoing that each member is interested in all of the party's principles. The genius of the Republican founders lay in their ability to satisfy a variety of groups by giving each what it wanted without unduly offending the other elements. In 1856 the newly-formed party went on record as opposing the extension of slavery, satisfying the numerous northern moderates but not the small group of radical abolitionists; it side-stepped a protective tariff policy and lost Pennsylvania, a mistake, perhaps, which was not repeated; it advocated national aid for a Pacific railroad and other internal improvements on which Democrats were divided; and by proposing a homestead law to give free land to free men it made its bid for the support of the northern masses. So skillfully were these diverse interests united that the party which had had a national organization for less than one year secured 114 of the 295 electoral votes in the 1856 presidential campaign.

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ST. JOHN, CHARLES. *Educational Achievement in Relation to Intelligence.* Cambridge, Massachusetts: Harvard University Press, 1930. xiv + 219 pp.

This volume is a comprehensive examination of the relation between achievement and intelligence. Part I is a rather thorough summary of previous research in this field together with a statement of the author's underlying educational theory. Part II reports a comprehensive statistical study which involves 503 boys and 455 girls in the public schools of a residential suburb of Boston in the first to the sixth grades inclusive over a period of four years. This part is followed by a supplementary chapter of case studies. The concluding chapter deals with problems of educational organization and method in the light of the author's conclusions.

The significant conclusions may be stated as follows: (1) There is a definite positive correlation between IQ and educational achievement and between IQ and school progress. (2) In both, the quality of achievement and in the rate of progress through the grades are many and sometimes marked exceptions to the general rule of correlation. (3) The average educational achievement of boys is lower than that of girls. This is also true of correlations between IQ and achievement. (4) Educational achievement is much less constant than is IQ. (5) Marks in effort (as conceived by teachers) and achievement test scores correlate with other achievement criteria about as highly as IQ does. It is recognized, however, that the "halo effect" influences these correlations.

Of especial interest is the author's findings of sex differences in achievement. He finds that there is conclusive evidence of maladjustments of the teaching methods and general conditions of schools and particular maladjustments of teachers themselves to boys. It would have been a real contribution if this study could have been pursued far enough to discover whether such sex differences exist in classes taught by men teachers. Unfortunately, the author's data did not permit this.

On the whole, the many intricate problems involved in this study have been well handled. The book is interestingly written and provides an up-to-date account of educational achievement in relation to intelligence. It concludes with a thought provoking chapter on the bearings of the study on educational organization and method.

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RESEARCH ABSTRACTS and BIBLIOGRAPHIES

Address all communications relative to research abstracts and bibliographies to Editor A. S. Barr, University of Wisconsin, Madison, Wisconsin.

BULLETINS

BARR, A. S., AND RUDISILL, MABEL. An *Annotated Bibliography on the Methodology of Scientific Research as Applied to Education.* Bulletin No. 13, Madison, Wisconsin: Bureau of Educational Research, University of Wisconsin, 1931.

Contains references relating to the general nature of research, the selection of a problem, the selection of a method of research, the selection of subjects, the collection of data and data gathering devices, the control of experimental conditions, the analysis and classification of data, the interpretation of findings, the reporting of research, standards for judging and improving research, a selected list of books on measurement, and selected books on statistics.

COOPER, WILLIAM J. *Record of Current Educational Publications,* January 1 to March 31, 1931. Bulletin No. 9. Washington: United States Government Printing Office, 1931.

Contains significant articles selected by 13 specialists in the major fields of education.

GOLDSMITH, ALERED N. "Present and Impending Applications to Education of Radio and Applied Arts." *Report of the Committee on Engineering Developments.* New York: National Advisory Council on Radio in Education, 1931.

Contains information on radio telephone broadcasting, high-power broadcast transmission, synchronization of broadcasting stations, electrically transcribed programs and their syndication, facsimile broadcasting, television, short-wave broadcasting, broadcasting over wires, sound motion pictures, costs, definition of terms, etc.

JONES R. G. "The Special Schools and Curriculum Centers." *Report of the Superintendent of Schools for the School Year of 1929-1930.* Cleveland: Cleveland Board of Education, 1931.

This bulletin contains materials on two phases of the work of the Cleveland Public Schools, namely a) special schools, and b) curriculum centers. The special schools, nine in number, represent one approach to the problem of individual differences. The curriculum centers are seeking to determine experimentally better methods of instruction.

MANAHAN, JOHN L. (Sec.-Treas.) *Addresses Delivered at the Annual Meeting of the Association of Virginia Colleges held in the Jefferson Hotel, Richmond, Virginia, February 13-14, 1931.*

Contains addresses, committee reports, etc.: Report of Committee on Research and Service; some factors in predicting academic success in the college of arts and sciences; diagnostic tests and remedial measures for college freshmen; personnel work in colleges, etc.

McMackin, Frank J. "Report of the Committee on Experimental Work in the Teaching of Mathematics of the Association of Mathematics Teachers of New Jersey," *Report of Proceedings of the New Jersey State High School Conference.* New Brunswick, New Jersey: State University of New Jersey, 1930.

Contains an analysis of the experimental work in progress in 38 high schools in the State of New Jersey.

Mudge, Isadore G. *University Bibliography.* New York: University Library, Columbia University, 1931.

Contains a list of publications of officers of the university, dissertations, publications on lecture foundations, departmental publications, alumni and student publications, official publications, and university press publications.

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Contains information concerning the vocational opportunities obtainable through the channels of the following departments: Business Administration, Education, Engineering, Fine Arts, Forestry, Journalism, Law, Liberal Arts, Library, Mines, Pharmacy, and Science.

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Bills, Arthur G. "Mental Work," *The Psychological Bulletin,* XXVIII (July, 1931), pp. 505-532.

A summary of investigations relating to mental work.

Spence, Ralph B., and Duncan, Ruth. "Educational Psychology: Some General Aspects of Learning and Teaching," *The Psychological Bulletin,* XXVIII (July, 1931), pp. 533-565.

A summary of investigations relating to certain general aspects of learning and teaching: motivation, individual differences, etc.

Chappell, Mathew N. "Inhibition, Facilitation, Learning: Summation of Stimuli," *The Psychological Review,* XXXVIII (July, 1931), pp. 317-331.

The author finds a fundamental fallacy in the concept of neural inhibitions and suggests that inhibitions and facilitation are merely parts of the total picture of summation of stimuli.

Eurich, Alvin C., and Carroll, Herbert A. "Group Differences in Art Judgment," *School and Society,* XXXIV (August 8, 1931), pp. 204-206.

The purpose of this paper is to present certain group differences derived from the application of the Meir-Seashore and McAdory tests. The author concludes: (1) that women and girls attain significantly higher scores on these tests than do men; (2) college students majoring in art exhibit decidedly keener critical ability in the field of art than do students majoring in other subjects.

Maier, Norman R. F. "Reasoning and Learning," *The Psychological Review,* XXXVIII (July, 1931), pp. 332-346.

The author finds that reasoning and learning are qualitatively different.

McGeoch, Grace O. "The Intelligence Quotient as a Factor in the Whole-Part Problem," *Journal of Experi-*

mental Psychology, XIV (August, 1931), pp. 333-358.

The author concludes that the whole method is reliably superior to the part method for both gifted and normal groups. Further differences are given for normal and gifted groups.

MUENZINGER, KARL F. "The Primary Factors in Learning," *The Psychological Review*, XXXVIII (July, 1931), pp. 346-358.

The claim is made that every habit exhibits four well-differentiated factors which should be considered separately in experimental studies of learning: tension, pattern of tasks, pattern of movements, and sensori-motor control.

STAGNER, ROSS. "The Reintegration of Pleasant and Unpleasant Experiences," *The American Journal of Psychology*, XLIII (July, 1931), pp. 463-468.

A study of the relation of emotional tone to memory. The author concludes that when intensity is held constant the unpleasant feeling tone is associated with poor retention.

EXPERIMENTAL STUDIES OF TEACHING

THOMPSON, WILLIAM H. "An Experiment in Remedial Reading," *School and Society*, XXXIV (August 1, 1931), pp. 156-158.

Whipple's High School and College Reading Test, Form A was administered to 273 freshmen in the Teachers College, University of Nebraska, October 23, 1930, and again on January 13, 1931. Thirty-eight pupils were placed in special remedial classes. The author concludes: (a) that 18 percent of the teachers college freshmen have less reading ability than the average child in the tenth grade; (b) college freshmen as a group do not improve in reading ability as a group; and (c) remedial reading classes improve the students' ability to read.

VOCATIONAL AND EDUCATIONAL GUIDANCE

ROSS, C. F. "A Method of Forecasting College Success," *School and Society*, XXXIV (July 4, 1931), pp. 20-22.

From an examination of the entrance credits of 590 freshmen to Allegheny College the author concludes that the number of credits offered in language offers a fair prognosis of what a student will do in college, particularly when this information is supplemented by information about the pupils grades in this subject. The relationship between the amount of mathematics and college attainments correspond roughly, but less marked, while the relation for the social natural sciences is a negative one.

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JOHNSON, J. B., AND OTHERS. "The Proposed 1932 College Testing Program of the Coöperative Test Service," *The Educational Record*, XII (July, 1931), pp. 344-352.

A summary of proposals for 1932 coöperative testing: covering tests, giving of tests, and scoring of tests.

RESEARCH NEWS and COMMUNICATIONS

Address all research news and communications to Editor Carter V. Good, Teachers College, University of Cincinnati, Cincinnati, Ohio.

SELECTED BIBLIOGRAPHY ON TECHNIQUES OF EDUCATIONAL RESEARCH AND RELATED PROBLEMS, 1930-1931 [1]

Compiled by CARTER V. GOOD
University of Cincinnati

The literature dealing with procedures in educational research has become so extensive within the past few years that the editors of the *Journal of Educational Research* plan to publish an annual bibliography of significant references in this field. Such a service is especially appropriate for the *Journal* and is similar to that performed annually in a number of other fields, notably reading and arithmetic.

The present bibliography covers the period from approximately May 1, 1930, to May 1, 1931, and is the second annual bibliography covering this field to be published in the *Journal*. No attempt has been made to include articles dealing with elaborate statistical and mathematical concepts.

CONTRIBUTIONS AND PLACE OF RESEARCH IN EDUCATION

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States that education should increase contributions to human progress, continue leadership in finance and industry, ameliorate social ills, reduce crime, increase wealth, and distribute more equitably the comforts of life.

Bauernfeind, H. K. "What Value Curriculum Making?" *School and Society*, XXXI (May 24, 1930), 710-12.

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Cattell, J. M. "The Usefulness of Psychology," *Science*, LXXII (September 19, 1930), 284-87.

Conklin, E. G. "Contributions of Biological Research to Education," *School and Society*, XXXI (June 7, 1930), 751-53.

Dewey, John. *The Man and His Philosophy*. Cambridge, Massachusetts: Harvard University Press, 1930.

Collection of addreses delivered at the meetings commemorating the seventieth birthday of Dewey.

Dorey, J. M. "Great Contributors to Education: VI, Emerson, A Prophet in Education," *Progressive Education*, VII (November, 1930), 334-38.

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Fernberger, S. W. "The Publications of American Psychologists," *Psychological Review*, XXXVII (November, 1930), 526-44.

An analysis of the publications of members of the American Psychological Association in 1928 in terms of years, fields, geographical distribution, degrees in relation to publications, etc.

Gortner, Ross Aiken. "The University and Fundamental Research," *Journal of Chemical Education*, VIII (April, 1931), 679-82.

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Hankins, Dorothy. "Living Leaders in Scientific Sociology," *Sociology and Social Research*, XV (September-October, 1930), 37-46.

An analysis of frequency of appearance of authors in the literature of sociology.

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Wonders of nature and discoverers of such phenomena.

Hertzler, J. O. "Modern Youth and the Research Spirit," *Scientific Monthly*, XXXII (March, 1931), 256-63.

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Lovett, R. M. "Great Contributors to Education: V, Charles W. Eliot," *Progressive Education*, VII (October, 1930), 267-70.

Metcalf, M. M., and Others. "The Place of Research in the Undergraduate College," *Association of American Colleges Bulletin*, XVI (May, 1930), 198-222.

A symposium.

Newlon, J. H., and Others. "George Drayton Strayer," *School Executives Magazine*, XLIX (June, 1930), 451-56.

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dividual differences, evaluation of new courses of study, etc.

Hartshorne, Hugh. "Present Status of Research in Character Education," *Religious Education*, XXV (June, 1930), 551-54.

Includes a statement of unsolved problems in the field.

Hopkins, L. T. "The Function of Research in Public School Home Economics," *Journal of Home Economics*, XXII (May, 1930), 358-64.

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Johnson, E. H. "History of Social Science Material in College Libraries," *Science*, LXXII (October 3, 1930), 340-41.

Urges the writing of such a history, especially in the physical sciences.

Judd, C. H. "A National Program of Educational Research," *Educational Record*, XI (July, 1930), 164-72.

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Judd, C. H. "A National Survey of Teacher Training," *Journal of the National Education Association*, XIX (December, 1930), 291-92.

Koos, L. V. "The National Survey of Secondary Education," *North Central Association Quarterly*, V (September, 1930), 219-24.

Loomis, A. K. "Curriculum Research in English," *English Journal, High School Edition*, XIX (May, 1930), 390-400.

Describes the Denver curriculum work in English.

Lund, F. H. "Educational Research in the Field of Emotion," *Educational Record*, XII (April, 1931), 138-43.

Points out needed research in this field.

McHale, Kathryn. "The American Association of University Women Study in Higher Education," *School and Society*, XXXII (August 2, 1930), 157-59.

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McHale, Kathryn. "College Ventures in the Intellectual Life," *Progressive Education*, VII (December, 1930), 404-7.

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Majo, S. S. "Neglected Phases of Ability Grouping in High School," *American School Board Journal*, LXXXI (July, 1930), 48.

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Woody, Clifford. *Summaries of Investigations Reported by Michigan Directors of Educational Research*. Bureau of Educational Reference and Research Bulletin, No. 130. Ann Arbor, Michigan: University of Michigan, 1930. Pp. 48.

Brief digest of research under way in the public schools of Michigan.

Wright, Edith A. *List of Educational Research Studies of State Departments of Education and State Education Associations*, No. 1. Office of Education Circular No. 31, January, 1931. Washington: Office of Education. Pp. 40.

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"Child Health and Protection," *Journal of the National Education Association*, XIX (November, 1930), 255-57.

Describes the White House Conference.

"Federal Relations to Education," *Elementary School Journal*, XXXI (September, 1930), 1-3.

"International Kindergarten Union Research Committee: Report of Progress," *Childhood Education*, VI (June, 1930), 461-63.

"Investigation of the Administration and Supervision of Secondary Education," *School and Society*, XXXII (September 6, 1930), 315-16.

Outlines a portion of the National Survey of Secondary Education, conducted by Fred Engelhardt of the University of Minnesota.

"Mapping Research Areas," *Ohio Schools*, VIII (June, 1930), 248.

A description of research problems promoted by research organizations in Ohio.

"National Joint Commission on Supervision," *School and Society*, XXXII (October 18, 1930), 523.

A commission made up of the Departments of Superintendence, Supervisors and Directors of Instruction, Elementary School Principals, and Classroom Teachers; the report of the commission is to be called "Cardinal Principles of Supervision."

"The Outlook in the Measurement of Interests," *Personnel Journal*, IX (August, 1930), 176-83.

Includes a list of 51 suggested problems for investigation, collected from workers in the field by the Research Committee upon the Measurement of Interests.

"A Report of Progress by the National Advisory Committee on Education," *School Review*, XXXVIII (September, 1930), 481-85.

Describes the study of federal relations to education.

"The Research Committee on Social Trends," *School and Society*, XXXII (December 6, 1930), 757-58.

Describes President Hoover's committee which has planned 27 investigations in various fields with C. H. Judd in charge of "Trends in Education."

"Research in Progress, July, 1929, to July, 1930," *University of North Carolina Record* (October, 1930), 1-107.

Reports research under way at North Carolina.

"The Study of Secondary-School Problems in New York State," *School Review*, XXXVIII (June, 1930), 402-4.

A series of studies under the direction of the State Department of Education dealing with the school population, pupil interests, vocational outlook of pupils, and pupil intelligence in relation to various factors.

"Survey of Public Education in Mississippi," *School and Society*, XXXII (September 6, 1930), 317-18.

A statement from the president of the Mississippi Education Association recommending a thorough study of the educational situation in the state.

"A Survey of Secondary Education," *Journal of the National Education Association*, XIX (October, 1930), 220.

Two Hundred Research Problems for a Five-Year Research Program into the Collegiate-Entrance Problem. Ohio College Association Bulletin, No. 61. Pp. 658-713. Obtainable from H. A. Toops, Ohio State University.

Lists in some detail projects and in some cases the investigators interested.

TYPES OF RESEARCH, METHODS OF COLLECTING DATA

Barr, A. S. "The Case Study Method in Education," *Journal of Educational Research*, XXII (June, 1930), 59-60.

Barr, A. S. "The Coefficient of Correlation," *Journal of Educational Research*, XXXIII (January, 1931), 56-60.

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Caswell, H. L. "The Alabama Curriculum Program," *Peabody Journal of Education*, VIII (July, 1930), 16-23.

Describes the work of a committee charged with curriculum construction in the State of Alabama.

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Caswell, H. L. "Do School Surveys Cause Superintendents to Lose Their Jobs?" *School Executives Magazine*, L (February, 1931), 267-68.

Cawthorne, H. W. *Science in Education.* (New York: Oxford University Press, 1931), pp. VI, 110.

Clugston, H. A., and Davis, R. A. "Suggested Criteria for the Philosophical Method of Research in Education," *Educational Administration and Supervision*, XVI (November, 1930), 575-80.

Crawford, C. C. *Studying the Major Subjects.* Los Angeles, California: C. C. Crawford, University of Southern California, 1930. Pp. 384.

Based on an analysis of the difficulties involved in studying the major subjects in secondary and higher education.

Crawford, C. C., and Leitzell, Edna M. *Learning a New Language.* Los Angeles, California: C. C. Crawford, University of Southern California, 1930. Pp. 242.

Based on personal interviews with experienced teachers and students and on an analysis of writings on the subject.

Crawford, C. C., and Phalen, Marie C. "A Summary of Methods in Composition Work," *English Journal*, College Edition, XIX (October, 1930), 615-20.

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Douglass, Harl R. "Types and Fields of Curriculum Research in Secondary Education During 1929," *School Review*, XXXVIII (November, 1930), 656-62.

Engelhart, M. D. "Experimentation as a Technique of Research," *Phi Delta Kappan*, XIII (August, 1930), 58-61.

Engelhart, M. D. "Techniques Used in Securing Equivalent Groups," *Journal of Educational Research*, XXII (September, 1930), 103-9.

Fisher, Irving. "Mathematics in the Social Sciences," *Scientific Monthly*, XXX (June, 1930), 547-57.

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Flaccus, Quintus H. "Research in the Payment of School Executives," *School and Society*, XXXII (December 13, 1930), 806-7.

A satire on educational research and the questionnaire method.

Freeman, F. N. "The Relation of Educational Psychology to Educational Sociology," *Journal of Educational Sociology*, III (June, 1930), 581-89.

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Freeman, F. N. "Teaching as an Applied Science," *Educational Method*, IX (May, 1930), 448-55.

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A study of the personality of boys between six and sixteen years of age; based on intensive case studies.

Garrett, H. E. *Great Experiments in Psychology*. (New York: Century Co., 1930), pp. xii + 338.

Gaw, Esther A. "Techniques Used in the Office of a Dean of Women," *Educational Research Bulletin*, IX (May 28, 1930), 289-323.

Deals with the techniques of social education, the interview, and self-education.

Hart, F. W. "Roboting Research," *School and Society*, XXXII (July 5, 1930), 19-21.

Emphasizes that the experimental approach is not the only available technique in the solution of educational problems.

Holy, T. C. "Making a Scientific School Plant Survey," *Nation's Schools*, VII (April, 1931), 21-27.

Howes, R. F. "Rhetorical Principles in the Case Work Interview," *Social Forces*, VIII (June, 1930), 540-43.

Jackson, D. C., and Jones, W. P. *This Scientific Age*. (New York: John Wiley and Sons, 1931), pp. viii + 354.

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LeChatelier, Henry M. "The Methodology of Scientific Research," *Journal of Chemical Education*, VII (November, 1930), 2584-89.

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McCloy, C. H. "Professional Progress Through Research," *Research Quarterly of the American Physical Education Association*, I (May, 1930), 63-73.

Deals with research methods in physical education.

Madsen, I. N. *Educational Measurement in the Elementary Grades.* (Yonkers-on-Hudson, New York: World Book Co., 1930), pp. X + 294.

Michell, Elene. *Teaching Values in New-Type History Tests.* (Yonkers-on-Hudson, New York: World Book Co., 1930), pp. X + 180.

Morey, Lloyd. "A University Statistical Service," *Journal of Higher Education*, I (November, 1930), 462-66.

Morton, R. L. "What Are Percentiles?" *Educational Research Bulletin*, IX (October 22, 1930), 423-24.

Murchison, Carl, and Others. *A History of Psychology in Autobiography.* Worcester, Massachusetts: Clark University Press, 1930.

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Odell, C. W. *Educational Measurement in High School.* (New York: Century Co., 1930), pp. 650.

Park, M. G. *A Problem-Outline in Principles and Techniques of Educational Measurement.* (New York: Century Co., 1930), pp. 126.

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